

②

# Test Specifications Fuel Injection Pumps ② and Governors

40

VDT-WPP 001/4 D00 11,1 b

Edition 11.66

En

PE 6 P 100/320 RS 27 RQ 200/1100 P 17 R  
 RS 69 .. PA24 R  
 PE 6 P 90/320 RS 69 RQ 200/1000 PA40 R  
 PE 6 P 100/320 RS 27, RS 69 RQV200-1100 PA 37R  
 See page 2!

supersedes

company:

D A F

engine:

 van Doorne, Eindhoven  
 P 680

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

## A. Fuel Injection Pump Settings

Port closing at prestroke 2,8 + 0,1 mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery 10 Ø cm <sup>3</sup> /100 strokes 3	Difference cm <sup>3</sup> /100 strokes 4	Control rod travel mm 2	Fuel delivery 9 Ø cm <sup>3</sup> /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	12	12,3 - 12,9	0,5		9,5 - 9,9	
600	9	5,2 - 6,2			2,9 - 3,9	
600	12	11,5 - 12,7			7,8 - 8,8	
600	15	17,3 - 18,5			12,8 - 14,3	
200	9	3,4 - 4,4			1,5 - 2,5	

Adjust the fuel delivery from each outlet according to the values in

Testoil-ISO 4113

## B. Governor Settings

RQ 200/1100 ..

Checking of slider PRG check		Full-load speed regulation				Idle speed regulation				Torque control	
Control rod travel mm 2		Setting point rev/min 3		Test specifications Control rod travel mm 5		Setting point rev/min 7		Test specifications Control rod travel mm 10		Control rod travel mm 12	
rev/min 1					rev/min 6					rev/min 11	
500	15,6-16,4	500	16,0	1100	15,6-16,0	490	0	100	6,0-8,1	-	-
				1120	10,5-15,4			200	4,4-6,4		
				1150	1,0-10,7			300	1,6-3,9		
				1180	0 - 5,5			390	0		
				1210	0						

Torque-control travel  
on flyweight assembly dimension a =

mm

Speed regulation: At

1 mm less control  
rod travel

## C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F)		Control rod stop		Fuel delivery characteristics		Starting fuel delivery Idle speed	
rev/min 1	cm <sup>3</sup> /1000 strokes 2	rev/min 3		rev/min 4	cm <sup>3</sup> /1000 strokes 5	rev/min 6	cm <sup>3</sup> /1000 strokes/mm 7
850							
850	114,5-117,5		ca. 128 cm <sup>3</sup> /1000 H.			100	26 - 28
ca.	10,5 mm RW						
850	114,5-117,5		1110 - 1120			100	mind. 21 mm RW

Checking values in brackets

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A1

## B. Governor Settings

RQV 200-1100 PA 37 R

D00 11,1 b

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Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	Torque-control travel rev/min	Torque-control travel mm
1	2	3	4	5	6	7	8	9	10	11
ca. 66	1100	14,8-17,8	-	-	-	ca. 10	100	6,3-8,0	-	-
	1150	10,0-14,1					200	4,5-6,9		
	1200	4,0-10,2					300	3,4-3,8		
	1250	0 - 6					400	2,6-3,8		
	1310	0					550	1,2-2,6		
							710	0		

Torque control travel a = 0 mm

**Testoil-ISO 4113**

## B. Governor Settings

RQ 200/1000 PA 40 R

Checking of slider		Full-load speed regulation				Idle speed regulation				Torque control	
PRG check		Setting point		Test specifications		Setting point		Test specifications			
rev/min	Control rod travel mm	rev/min	Control rod travel mm	Control rod travel mm	rev/min	rev/min	Control rod travel mm	rev/min	Control rod travel mm	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	10	11	12
450	15,7-16,3	450	16,0	1000	15,8-16,0	440	0	100	7,0-8,1	-	-
				1020	10,0-15,0			200	4,5-6,7		
				1050	0,5-10,0			300	0 - 2,5		
				1110	0			340	0		

Torque-control travel on flyweight assembly dimension a =

mm

Speed regulation At

1 mm less control rod travel

### Test sequence for full-load adjustment (RQ governor)

1. Screw stop bushing of excess-fuel stop for starting on to threaded bushing as far as it will go.
2. Fit excess-fuel stop for starting.
3. Set delivery (Section C, Columns 1 and 3) by turning back stop bushing at excess-fuel stop for starting. This operation represents setting of the control-rod stop.
4. Set full-load delivery (Section C, Column 2) at control lever and stop screw of governor.

En

③

# Test Specifications Fuel Injection Pumps and Governors

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VDT-WPP 001/4 VOL 10,0 a  
Edition 10.68

En

PE 6 P 100/320 RS 50

EP/MZ 80 P 2/1

supersedes

company

engine

10.66

Volvo

D 100 A

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

## A. Fuel Injection Pump Settings

Port closing at prestroke 2,6 + 0,1 mm (from BDC)

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm <sup>3</sup> /100 strokes	Difference cm <sup>3</sup> /100 strokes	Control rod travel mm	Fuel delivery cm <sup>3</sup> /100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	5	6	7
1000	12	11,5 - 12,3	0,5			2,5 ± 0,1* (max. 2,2-2,9)
600	6	0,5 - 1,2				
	9	4,6 - 5,8				
	12	11,4 - 12,2				
200	9	2,8 - 4,0				

Adjust the fuel delivery from each outlet according to the values in [ ]

## B. Governor Settings

Torque control travel mm	Leakage		Control-rod travel limitation breakaway*		Control rod travel test		Auxiliary spring auxiliary cam**		Torque control	
	Vacuum pressure drop mm water col. s	Time at least	Vacuum mm w.c.	Control rod travel mm	Vacuum mm w.c.	Control rod travel mm	Vacuum mm w.c.	Control rod travel mm	Vacuum mm w.c.	Control rod travel mm
1	2	3	4	5	6	7	8	9	10	11
	500-480 10				1090	4,8-5,4	700 900 1200 1500	11,7-12,3 6,4- 8,7 4,4- 5,1 4,3- 5,1		

control rod travel test (cols. 4-11)  
= rotational speed 500 rev/min.  
adjust breakaway (cols. 4-5) by means of shims\*  
cam adjustment (B 8-9 - C 7-8) by means of shims\*\*

## C. Settings for Fuel Injection Pump with Fitted Governor

Full-load stop screw Test oil temp. 40°C (104°F)			Fuel delivery characteristics			idle (stop)** idle (imbalance)		Control rod travel from full-load to idle mm cm <sup>3</sup> /1000 strokes
rev/min	Vacuum mm wat. col.	cm <sup>3</sup> /1000 strokes	rev/min	Vacuum mm wat. col.	cm <sup>3</sup> /1000 strokes	rev/min	Vacuum mm wat. col.	
1	2	3	4	5	6	7		8
600	0	105,0-107,0 ( 95,0- 97,0)	1080	0	113,0-117,0	Start 100 ca. 190		

Checking values in brackets

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**Testoil-ISO 4113**

①

# Valeurs d'essai Pompes d'injection ① et Régulateurs

40

VDT-WPP 001/4 SCA 11,0 f  
Edition 8.69

PE 6 P 90/720 RS 74	EP/MZ 80 P 3 R	./.	Remplace	6.67
RS 75	RQV 250-..PA 47 R		Firme:	Scania Vabis
RS 81	EP/MZ 80 P 4 R	./.	Moteur:	D 11

..Z..P Voir page 2!  
contrôle du début de refoulement sans/avec membrane

Toutes les valeurs d'essai ne sont valables que pour les bancs d'essai et les contrôleurs Bosch pour pompes d'injection

## A. Réglages de la pompe d'injection

Début de refoulement pour une précourse de 2,6 + 0,1 mm (à partir du P.M.B.)

Vitesse tr/mn 1	Course de la tige de réglage mm 2	Débit d'injection cm <sup>3</sup> /100 coups 3	Différence cm <sup>3</sup> /100 coups 4	Course de la tige de réglage mm 2	Débit d'injection cm <sup>3</sup> /100 coups 3	Tension initiale du ressort (soupape de correction) mm 6
1000	12	8,5 - 9,2	0,4			2,5 ± 0,1* (max. 2,2-2,9)
600	9	2,9 - 3,9	** En cas de dispersion plus importante, modifier en conséquence la tension initiale des ressorts des soupapes de refoulement. Section C, col. 6-7, 7-9			
	12	7,4 - 8,4				
	15	12,2 - 13,5				
200	9	1,8 - 2,8				

Réaliser l'équilibrage des débits d'après les valeurs encadrées

RQV 250-1100 PA 47 R Voir page 3

## B. Réglages du régulateur

Vitesse nominale maximale			Vitesse nominale moyenne			Vitesse nominale minimale			Course du manchon central ①	
Dévi- ation du levier de commande Degrés 1	tr/mn RW* mm 2	Course de la tige de réglage mm tr/mn ①a ②a	Dévi- ation du levier de commande Degrés 4	tr/mn 5	Course de la tige de réglage mm ④	Dévi- ation du levier de commande Degrés 7	tr/mn 8	Course de la tige de réglage mm ③	tr/mn 10	mm 11
ca. 68	1150	15,0-18,2	-	-	-	ca. 10	200	5,8-8,0	-	-
	1350	0 - 1,5					300	3,1-4,4		
ca. 62	1100	15,0-17,8					400	2,6-3,6		
	1150	10,2-13,8					500	1,8-3,0		
	1200	5,0-10,0					600	0,8-2,0		
	1250	0 - 3,2					780	0		
	1280	0				③a				

Course de correction.  
cote a =

mm.

RW\* = Course de la tige de réglage

## C. Réglages de la pompe d'injection avec régulateur accolé

Débit de pleine charge Butée de la tige de réglage (température de l'huile d'essai 40°C) ②		Limitation de vitesse vitesse intermédiaire ②b ④a		Variations du débit vitesse maximale à vide ⑤a ⑤b		Débit de surcharge au démarrage Ralenti point d'inversion ⑥		Course de correction ⑤	
tr/mn 1	cm <sup>3</sup> /1000 coups 2	tr/mn 3		tr/mn 4	cm <sup>3</sup> /1000 coups 5	tr/mn 6	cm <sup>3</sup> /1000 coups 7	tr/mn 8	mm RW* 9
1080	123,5-126,5 (14,0 ± 0,5 mmRW)	1120		600	113,0-117,0	1200	dispersion max. 0,4		Pe S 75
						100	21 - 26		./.

Valeurs de contrôle entre parenthèses.

\* Course de la tige de réglage inférieure de 1 mm à la valeur indiquée à la colonne 2.

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Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel Torque-control travel	
Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
<b>250 - 700</b>										
68±1,5	800	14,0-17,0	-	-	-	10±1,5	180	6,4-8,0	-	-
	950	0 - 1,5					250	4,2-7,0		
63±1,5	700	15,0-17,6					320	2,6-3,8		
	750	7,5-13,0					400	1,5-2,9		
	800	0 - 8,0					520	0		
	870	0								
<b>250 - 750</b>										
68±1,5	800	14,0-17,0				10±1,5	180	6,4-8,0	-	-
	950	0 - 1,5					250	4,2-6,5		
66±1,5	750	15,0-18,0					320	2,4-3,8		
	800	7,5-13,0					400	1,4-2,8		
	850	0 - 7,0					520	0		
	900	0								
<b>250 - 800</b>										
62±1,5	800	15,0-17,8				10±1,5	180	6,3-8,0		
	850	10,4-14,2					250	4,2-6,6		
	900	5,0-10,5					320	2,1-3,8		
	950	0 - 7					400	1,4-3,0		
	1030	0					590	0		
<b>250-850</b>										
64±1,5	850	15,0-18,0				10±1,5	180	6,4-8,0		
	900	10,0-14,4					250	4,0-6,2		
	950	4,2-10,4					320	2,0-3,6		
	1000	0 - 6					450	0,9-2,3		
	1060	0					580	0		
<b>250- 900</b>										
66±1,5	900	15,0-18,0				10±1,5	180	6,4-8,0		
	950	9,0-14,0					250	4,4-6,6		
	1000	2,0- 9,2					320	2,2-3,8		
	1030	0 - 7					450	0,3-1,5		
	1090	0					590	0		
<b>250 - 950</b>										
68±1,5	1000	15,0-18,2				10±1,5	180	6,3-8,0		
	1200	0 - 1,5					250	4,3-6,5		
66±1,5	950	15,0-18,0					320	2,5-3,8		
	1000	10,0-14,0					450	1,4-3,0		
	1050	3,0-10,0					630	0		
	1150	0								
<b>250 - 1000</b>										
68±1,5	1150	15,0-18,2				10±1,5	180	6,4-8,0		
	1360	0 - 1,5					250	4,3-6,5		
63±1,5	1000	15,0-18,0					320	2,8-3,8		
	1080	8,0-13,0					500	1,6-2,9		
	1150	1,6- 8,6					720	0		
	1270	0								
<b>250 - 1050</b>										
68±1,5	1150	15,0-18,2				10 ±1,5	180	6,4-8,0		
	1360	0 - 1,5					250	4,3-6,5		
64±1,5	1050	15,0-17,6					320	2,8-3,8		
	1120	9,0-13,3					500	1,5-4,0		
	1200	0,5- 7,8					720	0		
	1300	0								

**Testoil-ISO 4113**

## B. Governor Settings

Torque control travel mm 1	Leakage		Control rod travel limitation breakaway*		Control rod travel test		Auxiliary spring auxiliary cam**		Torque control	
	Vacuum pressure drop mm water col 2	Time at least s 3	Vacuum mm w c 4	Control rod travel mm 5	Vacuum mm w c 6	Control rod travel mm 7	Vacuum mm w c 8	Control rod travel mm ** 9	Vacuum mm w c 10	Control rod travel mm 11
-	800-760	10	-	-	415	4,1-6,3	335 370 400 440 480	13,5-14,5 7,8-11,4 4,4- 6,6 3,7- 6,0 3,0- 5,3		

control rod travel test (cols. 4-11)  
= rotational speed 500 rev/min  
adjust breakaway (cols. 4-5) by means of shims\*  
cam adjustment (B 8-9 - C 7-8) by means of shims\*\*

## C. Settings for Fuel Injection Pump with Fitted Governor

Full-load stop screw Test oil temp 40°C (104°F)			Fuel delivery characteristics			idle (stop)** idle (imbalance)		Control rod travel from full-load to idle
rev/min 1	Vacuum mm wat col 2	cm <sup>3</sup> /1000 strokes 3	rev/min 4	Vacuum mm wat col 5	cm <sup>3</sup> /1000 strokes 6	rev/min 7	Vacuum mm wat col 8	mm cm <sup>3</sup> /1000 strokes 8
1080	0	123,5-126,5	600	0	113,0-117,0	Start 100	210-260	

Checking values in brackets

Pump ..S 81 with governor ..P 4 R

Functional test of electromagnetic excess-fuel - shutoff stop:

Actuating the starting solenoid must cause the control rod to assume max. control-rod travel (approx. 21 mm control-rod travel).

Actuating the shutoff solenoid must cause the control rod to go immediately to stop; the stop is however to be set such that 1.5-2.5 mm control-rod travel is obtained!

Reduced full-load deliveries ..Z... ..P of pumps ..S 74, ..S 75, ..S 81:

Full load at n = (Tol.  $\pm$  1,0) Reduced control rod travel mm  
cm<sup>3</sup>/1000 H.

	1100	900	750	600 U/min	
X	116	115	110	105	- 0,5
Z	108	107	103	97	- 1,0
V	100	97	94	89	- 1,5
Y	94	91	87	83	- 1,9
U	89	86	82	78	- 2,2
T	83	78	75	71	- 2,6
S	78	72	68	65	- 3,0
R	73	65	61	57	- 3,4
Q	69	60	55	52	- 3,7
P	63	53	47	44	- 4,1

Testoil-ISO 4113

# Test Specifications Fuel Injection Pumps ② and Governors

En

PESV 8 P 90/320 LS 3 RQ 200/1050 PA 55 DR (1)  
 LS 5 RQ 200/1050 PA 67 DR (2)  
 LS 5 RQ 200/1100 PA 67 DR (3) ./.  
 LS 5 RQV200- PA 77 R (2-3)

supersedes 11.68

company: MAN

engine:  
 D 2658 M2 (1 - 250 PS)  
 M20 (2 - 250 PS)  
 M23 (3 - 275 PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

## A. Fuel Injection Pump Settings

Port closing at prestroke  $1,7 \pm 0,1$  mm (from BDC)  
 $3,1 \pm 0,1$  mm (from BDC)

LS 3

LS 5

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm <sup>3</sup> /100 strokes	Difference cm <sup>3</sup> /100 strokes	Control rod travel mm	Fuel delivery cm <sup>3</sup> /100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	2	3	6
1000	12	12,5 - 13,1	0,5			
600	6	1,6 - 2,6	Cam sequence 1-5-4-8-6-3-7-2-1 with 45° offset in each case (see BMP 115/5). Test pump with flushing: Inlet at right-hand plunger-and-barrel assembly bank. Return via overflow valve of left-hand plunger-and-barrel assembly bank.			
600	12	11,0 - 12,3				
600	15	16,0 - 17,3				
200	6	0,7 - 1,7				

Adjust the fuel delivery from each outlet according to the values in

Testoil-ISO 4113

## B. Governor Settings

RQ 200/1050 PA 55 D, 67 DR (1,2)

Checking of slider PRG check		Full-load speed regulation				Idle speed regulation				Torque control	
①		Setting point		Test specifications		Setting point		Test specifications		③	
rev/min	Control rod travel mm	rev/min	Control rod travel mm	Control rod travel mm	rev/min	rev/min	Control rod travel mm	rev/min	Control rod travel mm	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	10	11	12
500	15,7-16,3	500	16,0	1050	14,7	450	0	100	3,3-7,2	500	16,0
				1070	14,4-14,7			200	3,7-5,7	700	15,9-16,0
				1100	8,8-13,4			300	0 -2,4	900	15,0-15,3
				1130	2,0-10,0			360	0	1000	14,7
				1200	0						

Torque-control travel on flyweight assembly dimension a = 0,4 mm

Speed regulation: At

1 mm less control rod travel

## C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F)		Control rod stop	Fuel delivery characteristics		Starting fuel delivery Idle speed	
②		③a	③b		⑥	
rev/min	cm <sup>3</sup> /1000 strokes	rev/min	rev/min	cm <sup>3</sup> /1000 strokes	rev/min	cm <sup>3</sup> /1000 strokes/mm
1	2	3	4	5	6	7
1050	105,0 - 107,0	Sp. 6 - 7	800	108,0 - 111,0	100	ca. 20
			500	max. 112,0		
1100	116,0 - 118,0		800	107,5 - 110,5*		
			500	max. 104,0		

\*Should values not be attained, corresponding torque control can be fitted:  
 Use new torque-control sleeve 1 429 999 015! Torque-control-travel dimension  
 a = 0.15 mm. Test specifications then correspond to ..PA 126 DR; alter name-  
 plate! (see MAN 15.0 b)

Checking values in brackets

## B. Governor Settings

RQV 200-1050-1100 PA 77 R (2,3)

MAN 15,0 a

-2-

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel Torque-control travel	
Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
ca. 66	1100 1150 1200 1250 1330	15,0-18,0 10,5-14,8 4,5-11,2 0 - 7 0	-	-	-	ca. 10	100 200 300 500 730	7,0-8,2 4,8-7,3 3,4-4,2 1,9-3,3 0		

Torque control travel a = mm

## C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational-speed limitation	Fuel delivery characteristics		Starting fuel delivery Idle switching point		Intermediate rotational speed Torque-control travel	
rev/min	cm <sup>3</sup> /1000 strokes	rev/min	rev/min	cm <sup>3</sup> /1000 strokes	rev/min	cm <sup>3</sup> /1000 strokes	rev/min	mm
1	2	3	4	5	6	7	8	
1050	105 - 107	1120 bzw. 1070	800 500	max. 111 max. 112	100	ca. 20		
1100	116 - 118		800 500	max. 110,5 max. 104				

Checking values in brackets

\* 1 mm less control rod travel than col 2

Testoil-ISO 4113

## B. Governor Settings

RQ 200/1100 PA 67 DR (3)

Checking of slider PRG check		Full-load speed regulation				Idle speed regulation				Torque control	
Control rod travel mm		Setting point		Test specifications		Setting point		Test specifications		Control rod travel mm	
rev/min	mm	rev/min	mm	rev/min	mm	rev/min	mm	rev/min	mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11	12
500	15,7-16,3	500	16	1100 1150 1180 1230	15,7-16,0 6,0-13,0 0 - 8,8 0	460	0	100 200 300 360	6,2-8,1 4,1-6,2 0,6-3,1 0		

Torque-control travel on flyweight assembly dimension a = mm

Speed regulation At

1 mm less control rod travel

## C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F)		Control rod stop	Fuel delivery characteristics		Starting fuel delivery Idle speed	
rev/min	cm <sup>3</sup> /1000 strokes	rev/min	rev/min	cm <sup>3</sup> /1000 strokes	rev/min	cm <sup>3</sup> /1000 strokes / mm
1	2	3	4	5	6	7

En Checking values in brackets

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# Test Specifications Fuel Injection Pumps ② and Governors

VDT-WPP 001/4 MAN 15,0 b  
Edition 5.71

En

PESV 8 P 90/320 LS 11 \*  
PESV 8 P 90/320 LS 11Z  
PESV 8 P 90/320 LS 11Z  
LS 11

RQ 200/1100 PA 67 DR (3)  
RQV200-1100 PA 77 R (3-4)  
RQ 200/1100 PA 67 DR (4)  
PA 126DR (4)

supersedes -  
company: MAN  
engine: D 2658 M23 (275PS-3)  
D 2858 M 1 (304PS-4)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

## A. Fuel Injection Pump Settings

Port closing at prestroke

mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm <sup>3</sup> /100 strokes 3	Difference cm <sup>3</sup> / 100 strokes 4	Control rod travel mm 2	Fuel delivery cm <sup>3</sup> /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	12	12,5-13,1	0,5			
600	6	1,6- 2,6	Cam sequence 1-5-4-8-6-3-7-2-1 with 45° offset in each case (see BMP 115/5). Test pump with flushing: Inlet at right-hand plunger-and-barrel assembly bank. Return via overflow valve of left-hand plunger-and-barrel assembly bank.			
600	12	11,0-12,3				
600	15	16,0-17,3				
200	6	0,7- 1,7				

Adjust the fuel delivery from each outlet according to the values in

Testoil-ISO 4113

## B. Governor Settings

RQ..PA 67 DR (3,4)

Checking of slider PRG check		Full-load speed regulation				Idle speed regulation				Torque control	
①		Setting point		Test specifications		Setting point		Test specifications		③	
rev/min 1	Control rod travel mm 2	rev/min 3	Control rod travel mm 4	Control rod travel mm 5	rev/min 6	rev/min 7	Control rod travel mm 8	rev/min 9	Control rod travel mm 10	rev/min 11	Control rod travel mm 12
500	15,7-16,3	500	16,0	1100	15,7-16,0	460	0	100	6,2-8,1		
				1150	6,0-13,0			200	4,1-6,2		
				1180	0 - 8,8			300	0,6-3,1		
				1230	0			360	0		

Torque-control travel  
on flywheel assembly dimension a =

mm

Speed regulation: At

1 mm less control  
rod travel

## C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F)		Control rod stop		Fuel delivery characteristics		Starting fuel delivery Idle speed	
②		③a		③b		⑥	
rev/min 1	cm <sup>3</sup> /1000 strokes 2	rev/min 3		rev/min 4	cm <sup>3</sup> /1000 strokes 5	rev/min 6	cm <sup>3</sup> /1000 strokes/mm 7
1100	116,0-118,0	Sp. 6 - 7		800	107,5-110,5*	100	ca.20
				500	max. 104,0		
*Should values not be attained, corresponding torque control can be fitted: Use new torque-control sleeve 1 429 999 015! Torque-control-travel dimension a = 0.15 mm. Test specifications then correspond to ..PA 126 DR; alter name- plate!							

Checking values in brackets

## C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F)		Control rod stop	Fuel delivery characteristics		Starting fuel delivery Idle speed	
rev/min	cm <sup>3</sup> /1000 strokes	rev/min	rev/min	cm <sup>3</sup> /1000 strokes	rev/min	cm <sup>3</sup> /1000 strokes / mm
1	2	3	4	5	6	7
1100	120,0-122,0	Sp. 6 - 7	800 500	115,0-118,0* max. 111,5	100	ca.24
*Torque-control-travel dimension a = 0.15 mm; use torque-control sleeve 1 429 999 015! Test specifications then correspond to ..PA 126 DR; alter nameplate!						

Checking values in brackets

## B. Governor Settings

Checking of slider PRG check		Full-load speed regulation				Idle speed regulation				Torque control	
rev/min	Control rod travel mm	Setting point	Test specifications		Setting point	Test specifications		Setting point	Test specifications		Control rod travel mm
1	2	3	4	5	6	7	8	9	10	11	12
500	15,7-16,3	500	16,0	1120 1150 1180 1230	15,0-15,4 7,7-13,4 0 - 8,5 0	470	0	100 200 300 370	6,6-8,1 4,6-6,7 1,2-3,6 0	900 1000	15,8-16,0 15,3-15,5
Refer to (4) for full load											

Torque-control travel on flyweight assembly dimension a =

mm

Speed regulation: At

1 mm less control rod travel

## B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel Torque-control travel	
Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
ca.66	1100 1150 1200 1250 1330	15,0-18,0 10,5-14,8 4,5-11,2 0 - 7 0	-	-	-	ca.10	100 200 300 500 730	7,0-8,2 4,8-7,3 3,4-4,2 1,9-3,3 0	-	-

Torque control travel a = mm

## C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational-speed limitation	Fuel delivery characteristics		Starting fuel delivery Idle switching point		Intermediate rotational speed Torque-control travel	
rev/min	cm <sup>3</sup> /1000 strokes	rev/min	rev/min	cm <sup>3</sup> /1000 strokes	rev/min	cm <sup>3</sup> /1000 strokes	rev/min	mm
1	2	3	4	5	6	7	8	
1100 (3)	116 - 118	1120	800 500	max.110,5 max.104	100	ca.20		
1100 (4)	120 - 122	1120	800 500	max.118 max.111,5	100	ca.24		

Checking values in brackets

\* 1 mm less control rod travel than col. 2

Testoil-ISO 4113

①

# Test Specifications Fuel Injection Pumps ① and Governors

VDT-WPP 001/4 VOL 12,0b

40

1. Edition

En

PE 6 P 110/320 RS 174 RQV 200-1100 PA 99 /2R

..A.. RS 174 RQV 200-1100 PA125/ 2R

Port-closing test with/without ROBO diaphragm

supersedes

company: Volvo

D 120

engine:

\*\* In the case of greater dispersion alter the delivery-valve spring pre-tension accordingly.

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

## A. Fuel Injection Pump Settings

Port closing at prestroke 2,6 + 0,1 mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm <sup>3</sup> /100 strokes 3	Difference cm <sup>3</sup> /100 strokes 4	Control rod travel mm 2	Fuel delivery cm <sup>3</sup> /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	12	17,9-18,7	0,6			2,5±0,1* (max.2,2-2,9)
600	6	3,0- 4,2				
	12	17,3-18,8				
	15	23,5-25,3				
200	6	1,1- 2,1				

Adjust the fuel delivery from each outlet according to the values in .

Testoil-ISO 4113

## B. Governor Settings

RQV .. 99/2R, 125/2R

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	mm 11
ca. 68	1150	15,5-18,3				ca. 23	100	7,0-10,0	200	1,5-2,3
	1410	0					200	5,0- 8,4	500	3,6-4,0
ca. 66	1100	15,0-18,0					300	2,4- 5,2	1150	8,3
	1200	7,2-12,6					400	0 - 2,2		
	1260	2,0- 9,0					460	0	-	-
	1400	0				3a				

Torque control travel a = mm

## C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) ②		Rotational-speed limitation intermediate speed ②b	Fuel delivery characteristics high idle speed ⑤b		Starting fuel delivery idle switching point ⑥		Torque-control travel ⑤	
rev/min 1	cm <sup>3</sup> /1000 strokes 2	rev/min 3	rev/min 4	cm <sup>3</sup> /1000 strokes 5	rev/min 6	cm <sup>3</sup> /1000 strokes 7	rev/min 8	Control rod travel mm 9
700	119,0-121,0 118,0-122,0	1150			100	380-410		
					200	12-16	)*	
					dispersion max.1,5		)	

Checking values in brackets

\* 1 mm less control rod travel than col. 2

8.74

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②

# Test Specifications Fuel Injection Pumps ② and Governors

40

VDT-WPP 001/4  
Edition 24.7.70

En

PE 6 P 120/320 RS155 RQ 300/750 PA105R  
RQ 250/750 PA105R

supersedes 9.7.70  
company: Daimler-Benz  
engine: MB 846 Bb  
(319 PS)  
WMD-Yugoslavia railcar

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

## A. Fuel Injection Pump Settings

Port closing at prestroke 2,8 + 0,1 mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm <sup>3</sup> /100 strokes 3	Difference cm <sup>3</sup> /100 strokes 4	Control rod travel mm 2	Fuel delivery cm <sup>3</sup> /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
600	6	6,4 - 7,6	0,8			
	12	20,8 - 21,5				
	15	25,6 - 27,6				
200	6	2,6 - 3,6				

Adjust the fuel delivery from each outlet according to the values in

Testoil-ISO 4113

## B. Governor Settings

Checking of slider PRG check rev/min 1		Full-load speed regulation Setting point rev/min 3		Test specifications Control rod travel mm 5 rev/min 6		Idle speed regulation Setting point rev/min 7		Test specifications Control rod travel mm 9 rev/min 10		Torque control rev/min 11 Control rod travel mm 12	
550	15,7-16,3	550	16,0	750	15,6-16,0	520	0	250	6,9-8,1	-	-
				770	10,0-14,8			300	4,8-7,2		
				800	0 - 8,4			350	2,1-4,8		
				840	0			420	0		

Torque-control travel  
on flyweight assembly dimension a =

mm

Speed regulation: At

1 mm less control  
rod travel

## C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F) rev/min 1		Control rod stop rev/min 3		Fuel delivery characteristics rev/min 4		Starting fuel delivery Idle speed rev/min 6	
730	296,0-300,0 (14,8-15,1 mm RW)	750		300	66,0 . 70,0 (6,8-7,2 mm RW)		
730	288,0-292,0						
At 765 min-1, control-rod travel must be 0.5 - 1.0 mm less than in Column 2! When performing check, increase values (Columns 2 and 5) by $\pm 1$ cm <sup>3</sup> /1000 strokes!							

Checking values in brackets

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AAS

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## B. Governor Settings

RQ 250/750 PA 105 R

Checking of slider PRG check		Full-load speed regulation				Idle speed regulation				Torque control	
①		Setting point		Test specifications		Setting point		Test specifications		③	
rev/min	Control rod travel mm	rev/min	Control rod travel mm	Control rod travel mm	rev/min	rev/min	Control rod travel mm	rev/min	Control rod travel mm	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	10	11	12
PRG 2	428 100 024		RQ	250/750 P			torque-control travel		Maß a	=	- m
500	15,7-16,3	500	16,0	660	15,6-16,0	500	0	100	6,2-8,1	-	-
				800	7,4-13,0			200	4,7-6,9		
				830	0 - 9,0			300	1,9-4,3		
				890	0			410	0		

Torque-control travel  
on flyweight assembly dimension a =

mm

Speed regulation At

1 mm less control  
rod travel

## C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F)		Control rod stop		Fuel delivery characteristics		Starting fuel delivery Idle speed	
②		③a		③b		⑥	
rev/min	cm <sup>3</sup> /-1000 strokes	rev/min		rev/min	cm <sup>3</sup> /-1000 strokes	rev/min	Control rod travel cm <sup>3</sup> /1000 strokes / mm
1	2	3		4	5	6	7

Checking values in brackets

## B. Governor Settings

Checking of slider PRG check		Full-load speed regulation				Idle speed regulation				Torque control	
①		Setting point		Test specifications		Setting point		Test specifications		③	
rev/min	Control rod travel mm	rev/min	Control rod travel mm	Control rod travel mm	rev/min	rev/min	Control rod travel mm	rev/min	Control rod travel mm	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	10	11	12

Torque-control travel  
on flyweight assembly dimension a =

mm

Speed regulation At

1 mm less control  
rod travel

## C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F)		Control rod stop		Fuel delivery characteristics		Starting fuel delivery Idle speed	
②		③a		③b		⑥	
rev/min	cm <sup>3</sup> /-1000 strokes	rev/min		rev/min	cm <sup>3</sup> /-1000 strokes	rev/min	Control rod travel cm <sup>3</sup> /1000 strokes / mm
1	2	3		4	5	6	7

En Checking values in brackets

Testoil-ISO 4113

①

# Test Specifications Fuel Injection Pumps ① and Governors

40

VDT-WPP 001/4 SCA 11,0 h  
Edition 10.69

En

PE 6 P 100/720 RS 95, Z...M RQV 250- ... PA 58R (1)  
PE 6 P 100/720 RS110, Z...M EP/RSV 350-1100P1/310 R(2)  
Start-of-delivery test without - delivery test with  
Robodiaphragm!  
Manifold-pressure compensator and reduced full-load  
deliveries, page 4

supersedes  
company: Scania Vabis  
engine: DS 11

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

## A. Fuel Injection Pump Settings

Port closing at prestroke 2,6 + 0,1 mm (from BDC) 2,4 + 0,1 S110 Y

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm <sup>3</sup> /100 strokes	Difference cm <sup>3</sup> / 100 strokes	Control rod travel mm	Fuel delivery cm <sup>3</sup> /100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	2	3	6
1000	12	14,0 - 14,4	0,6			2,5 ± 0,1* (max. 2,2-2,9)
600	9	8,2 - 9,4				
600	12	13,6 - 14,9				
600	15	18,6 - 20,1				
200	9	5,9 - 6,9				

Adjust the fuel delivery from each outlet according to the values in  .

Testoil-ISO 4113

## B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min Control rod travel mm	Control rod travel mm rev/min	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
250-1100 ca. 61	PA 58 R (FD → 712)* 1100 15,0-17,6 1150 13,0-14,6 1200 6,5-13,5 1270 0 - 7,0 1370 0	1a 2a	-	-	-	ca. 25	100 6,9-10,0 200 5,1- 8,3 300 2,4- 5,0 400 0 - 2,4 460 0	3a	-	-

\* Torque control travel a = mm  
In the case of greater dispersion alter the delivery-valve spring pre-tension accordingly.

## C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational-speed limitation intermediate speed	Fuel delivery characteristics high idle speed		Starting fuel delivery idle switching point		Torque-control	
rev/min	cm <sup>3</sup> /1000 strokes	rev/min	rev/min	cm <sup>3</sup> /1000 strokes	rev/min	cm <sup>3</sup> /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9
1100 (12,5 ± 0,5 mm RW)	144,0-146,0	1120	charge-air pressure 0,4	148,0-152,0	1000	24,0-29,0	max. 0,15)*	./.
			600	charge-air pressure 500	225	0,9 - 1,3 dispersion max. 0,4		
				121,0-127,0	1200	3,9 - 4,4 dispersion max. 0,4		
(increase by ± 0,5 cm <sup>3</sup> !)								

Checking values in brackets

\* 1 mm less control rod travel than col. 2

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The numbers denote the sequence of the tests

**B. Governor Settings**

① Upper rated speed rev/min			Intermediate rated speed			④ Lower rated speed			③ Torque control	
Degree of deflection of control lever	Control rod travel mm	Control rod travel mm rev/min				Control-lever deflection in degrees	rev/min	Control rod travel mm	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	10	11
250-1110 ca. 66	1100 1150	14,0-16,0 9,2-13,3	100 PA 58 R (FD from 801)*			ca. 10	210 270 370 430 570 650	5,7-8,0 3,4-6,0 2,2-3,8 1,4-2,7 0 -1,2 0		
②a	1200 1230 1310	3,6- 9,6 0 - 7,2 0								

**C. Settings for Fuel Injection Pump with Fitted Governor**

②b Full-load stop		⑥ Rotational-speed limitat.		③a Fuel delivery characteristics		Starting fuel delivery		⑤ Idle stop	
Test oil temp. 40°C (104°F)		Note: changed to ...)				Idle			
rev/min	cm³/1000 strokes	rev/min	cm³/1000 strokes	rev/min	cm³/1000 strokes	rev/min	cm³/1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	
* convert when performing repairs: Spring set 1 424 617 022, -- 634 027, . 619 027. Cam 1 421 332 000 Washers (as required) 1 420 101 023									

Checking values in brackets

\* 1 mm less control rod travel than col. 2

**B. Governor Settings**

① Upper rated speed rev/min			Intermediate rated speed			④ Lower rated speed			③ Torque control	
Degree of deflection of control lever	Control rod travel mm	Control rod travel mm rev/min				Control-lever deflection in degrees	rev/min	Control rod travel mm	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	10	11
ca. 62	1100 1150 1200	16,0 11,8 5,8	without auxiliary spring			ca. 29	350 100 350 400 460	6,0 19 - 21 5,7-6,3 1,1-3,6 0 - 1	1080 500 380	0 0 1,2-1,8
②a	1150 1200 1320	10,5-12,6 3,5- 8,0 0 - 1	with auxiliary spring							

**C. Settings for Fuel Injection Pump with Fitted Governor**

②b Full-load stop		⑥ Rotational-speed limitat.		③a Fuel delivery characteristics		Starting fuel delivery		⑤ Idle stop	
Test oil temp. 40°C (104°F)		Note: changed to ...)				Idle			
rev/min	cm³/1000 strokes	rev/min	cm³/1000 strokes	rev/min	cm³/1000 strokes	rev/min	cm³/1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	
(2) 1100	144,0-146,0	1120	600	148,0-152,0	350	1,2 - 1,5 dispersion max. 0,15 1200 3,9-4,4 dispersion max. 0,4	350	6,0	

Checking values in brackets

\* 1 mm less control rod travel than col. 2

Testoil-ISO 4113

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11

250-700

ca.66 800 14,0-17,3 - - - ca.10 150 7,0-8,0

ca.58	950	0 - 1,5					250	4,3-6,6		
	700	14,5-17,2					350	2,3-3,5		
	750	9,0-13,0					450	0,8-2,2		
	800	3,0- 9,0					530	0		
	890	0								

250 - 750

ca.66 800 14,0-17,3 ca.10 150 7,0-8,0

ca.62 750 15,0-17,6

800 8,5-14,3 450 0,8-2,2

850 1,4- 8,3 530 0

900 0

250 - 800										
-----------	--	--	--	--	--	--	--	--	--	--

ca.66 800 14,0-17,3 ca.10 150 7,0-8,0

850 6,0-11,8 250 4,3-6,6

900 0 - 5,8 350 2,3-3,5

950 0 - 1,5 450 0,8-2,2

530 0

250 - 850										
-----------	--	--	--	--	--	--	--	--	--	--

ca.66 900 12,8-15,8 ca.10 150 7,0-8,0

1060 0 - 1,5 250 3,7-5,9

ca.63 850 15,0-17,8 350 2,2-3,5

900 9,3-13,4 450 1,1-2,3

950 2,8- 8,8 570 0

1040 0 - 1

250 - 900										
-----------	--	--	--	--	--	--	--	--	--	--

ca.66 900 12,8-15,8 ca.10 150 7,0-8,0

950 6,0-11,0 250 3,7-5,9

1000 0 - 6,0 350 2,2-3,5

1060 0 450 1,1-2,3

570 0

250-950										
---------	--	--	--	--	--	--	--	--	--	--

ca.66 1000 13,0-15,6 ca.10 150 6,6-8,0

1200 0 - 1,5 250 3,9-6,0

ca.63 950 14,8-17,2 350 1,9-3,4

1000 10,5-13,7 450 0,3-2,5

1080 2,4- 8,0 550 0

1190 0

250-1000										
----------	--	--	--	--	--	--	--	--	--	--

ca.66 1000 13,0-15,6 ca.10 150 6,6-8,0

1050 8,0-12,1 250 3,9-6,0

1100 2,3- 8,2 350 1,9-3,4

1200 0 450 0,3-2,5

550 0

250 - 1050										
------------	--	--	--	--	--	--	--	--	--	--

ca.66 1050 14,0-17,8 ca.10 150 6,6-8,0

1100 10,5-14,6 250 3,8-6,1

1150 5,7-11,0 350 2,0-3,4

1200 0 - 7,2 450 0,4-1,8

1290 0 570 0

250 - 1050										
------------	--	--	--	--	--	--	--	--	--	--

ca.66 1050 14,0-17,8 ca.10 150 6,6-8,0

1100 10,5-14,6 250 3,8-6,1

1150 5,7-11,0 350 2,0-3,4

1200 0 - 7,2 450 0,4-1,8

1290 0 570 0

250 - 1050										
------------	--	--	--	--	--	--	--	--	--	--

ca.66 1050 14,0-17,8 ca.10 150 6,6-8,0

1100 10,5-14,6 250 3,8-6,1

1150 5,7-11,0 350 2,0-3,4

1200 0 - 7,2 450 0,4-1,8

1290 0 570 0

Testoil-ISO 4113

Setting of smoke limiter (new version - pump S 95)

Basic setting of pump and governor (Section A - B) without smoke limiter.

Fit smoke limiter: set full-load delivery at stop screw of bell crank at  $500 \text{ min}^{-1}$  and  $0 \text{ kp/cm}^2$  (without charge-air pressure). By pressing on diaphragm (connect up compressed air) adjust stop such that more control-rod travel is obtained than that required for full-load delivery at maximum charge-air pressure.

Then set full-load delivery at stop screw in housing at  $1100 \text{ min}^{-1}$  and  $0.4 \text{ kp/cm}^2$  and measure fuel-delivery characteristics.

Check difference in control-rod travel between pressure-charging and induction approx. 1.4 mm.

Stop adjustment:

At  $0.27 - 0.29 \text{ kp/cm}^2$  (197 - 213 mm Hg) and  $500 \text{ min}^{-1}$  there must have been a 0.1 mm decrease in full-load control-rod travel.

At  $0.11 - 0.15 \text{ kp/cm}^2$  (82 - 112 mm Hg) and  $500 \text{ min}^{-1}$  there must have been a 1.3 mm reduction in full-load control-rod travel.

Adjust by altering initial tension of spring, i.e. turn guide bushing of helical spring.

Reduced full-load deliveries

	Full load in $\text{cm}^3/1000$ strokes (tol. $\pm 1.0$ )				Reduced control-rod travel mm	
	at n =					
	S 95 .. S 110..	1100	900	750	600 U/min	
Y*	-	160	166	162	+ 0,6	FB 2,4 $\pm$ 0,1
X	136	141	144	138	- 0,6	
Z	129	133	134	128	- 1,1	
U	124	128	128	123	- 1,4	
T	120	124	124	118	- 1,6	
S	110	113	112	106	- 2,2	
k	103	103	102	97	- 2,6	
Q	94	94	91	86	- 3,1	
P	86	85	81	75	- 3,6	
O	79	75	70	64	- 4,1	
N	73	67	61	53	- 4,5	
M	69	61	53	44	- 4,8	

\* Setting Y only for pump S 110.

①

# Test Specifications Fuel Injection Pumps ① and Governors

40

VDT-WPP 001/4 VOL 10,0b 1

2. Edition

En

PE 6 P 100/320 RS 100 RQV 200-1100 PA 60/2R (1)  
RS 100 W PA 60/2R

supersedes 11.73  
company: Volvo  
engine: TD 100 A

..A..RS 100 Y RQV 200-1100 PA 60/2R (2)  
RS 100 V PA 60/2 R (3)

Port-closing test with/without ROBO diaphragm

See page 2!

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

## A. Fuel Injection Pump Settings

Port closing at prestroke 2,6 + 0,1 mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm <sup>3</sup> /100 strokes 3	Difference cm <sup>3</sup> /100 strokes 4	Control rod travel mm 2	Fuel delivery cm <sup>3</sup> /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	12	12,7-13,4	0,5			2,5 ± 0,1*
600	9	6,1- 7,3	* In the case of greater dispersion alter the delivery-valve spring pre-tension accordingly.			
	12	11,3-12,7				
	15	16,5-18,2				
200	9	4,2- 5,2				

Adjust the fuel delivery from each outlet according to the values in

\* Con mayor desequilibrio de caudales, modificar correspondientemente la tension previa del muelle de la válvula de presión.

## B. Governor Settings

RQV .. 60/2 R (1-3)

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min	Control rod travel	Degree of deflection of control lever	rev/min	Control rod travel	Degree of deflection of control lever	rev/min	Control rod travel	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
ca. 68	1150	15,5-18,3				ca. 23	100	7,0-10,0	1150	8,3
	1410	0					200	5,0- 8,4		
ca. 66	1100	15,0-18,0					300	2,4- 5,2	-	-
	1200	7,2-12,6					400	0 - 2,2		
	1260	2,0- 9,0					460	0		
	1400	0				(3a)				

Torque control travel a = mm

## C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational-speed limitation intermediate speed		Fuel delivery characteristics high idle speed		Starting fuel delivery Idle switching point		Torque-control travel	
rev/min	cm <sup>3</sup> /1000 strokes	rev/min	cm <sup>3</sup> /1000 strokes	rev/min	cm <sup>3</sup> /1000 strokes	rev/min	cm <sup>3</sup> /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	
0,5 kp/cm <sup>2</sup>				0 kp/cm <sup>2</sup>					
(1) 700	145,0-148,0	1140-1150**	700	114,5-118,5	100	ca. 240,0			
(2) 700	125,0-127,0		700	105,0-108,0	225	11,0-15,0			
(3) 700	133,0-135,0		700	115,0-118,0		dispersion max. 2,5			
(increase by ± 1,0 cm <sup>3</sup> !)		(aumentar en ± 1,0 cm <sup>3</sup> !)						)*	

Checking values in brackets

\* 1 mm less control rod travel than col. 2

Testoil-ISO 4113

1. Pay attention to RQV governor instructions WPP 001/4, 6th Supplement!
2. Sliding-sleeve position - abnormal 36.0 mm with governor 60/2!
3. LDA (manifold-pressure compensator) setting:  
Basic setting of pump and governor without LDA.

Fit LDA: at 700 min<sup>-1</sup> and 0 kp/cm<sup>2</sup> set full-load delivery at stop screw of bell crank.

By pressing on diaphragm - connect up compressed air - adjust stop such that more control-rod travel is obtained than that required for full load at max. charge-air pressure. Then set full load at stop screw in housing at 700 min<sup>-1</sup> and max. pressure.

4. LDA adjustment -  $n = 500 \text{ min}^{-1}$  - decreasing pressure in kp/cm<sup>2</sup>

Pump	S 100	S 100 Y	S 100 V	S 100 W
Setting	0.24-0.27	0.24-0.27	0.16-0.19	0.24-0.27
Measurement	0.07-0.12	0.07-0.12	0.08-0.11	0.12-0.18

①

# Test Specifications Fuel Injection Pumps ① and Governors

40

VDT-WPP 001/4 MB11,8 d

1. Edition

En

PE 6 P 100 A 720 RS 279 RQV 300-1100 PA 244 R  
 RS 279 RQV 300-1100 PA 245 R  
 RS 279 Z RQV 300-1100 PA 246 R  
 RS 279 RQV 300-450/1100 PA 261 R  
 RQV governors - WPP 001/4, 6th Supplement!

supersedes

company: Daimler-Benz  
 engine: OM 355  
 (240 PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

## A. Fuel Injection Pump Settings

Port closing at prestroke 2,8+0,1 mm (from BDC) (-0,05)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm <sup>3</sup> /100 strokes 3	Difference cm <sup>3</sup> /100 strokes 4	Control rod travel mm 2	Fuel delivery cm <sup>3</sup> /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	12	11,7 - 12,4	0,4			
600	9	5,0 - 6,2				
600	15	15,3 - 17,0				
200	9	3,5 - 4,5				

Adjust the fuel delivery from each outlet according to the values in .

Testoil-ISO 4113

## B. Governor Settings

.. 244R, 245R, 246 R

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever 1	rev/min 2	Control rod travel mm 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	mm 11
ca. 68	1120	15,0-18,0	-	-	-	ca. 12	100	6,5-8,2	1120	8,3
	1170	10,0-14,4					250	4,7-6,5		
	1210	5,8-11,4					400	2,5-4,0	-	-
	1260	0 - 7,4					570	0 - 1,1		
	1350	0					620	0		

Torque control travel a = mm

## C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) ②		Rotational-speed limitation intermediate speed ④a	Fuel delivery characteristics high idle speed ⑤b		Starting fuel delivery idle switching point ⑥		Torque-control travel ⑤	
rev/min 1	cm <sup>3</sup> /1000 strokes 2	rev/min 3	rev/min 4	cm <sup>3</sup> /1000 strokes 5	rev/min 6	cm <sup>3</sup> /1000 strokes 7	rev/min 8	Control rod travel mm 9
1100	118,0-120,0 117,0-121,0	1130-1150*			100	14 - 16	600	6.0±0.5 mm control-rod travel adjustment

Checking values in brackets

\* 1 mm less control rod travel than col. 2

5.74



**B. Governor Settings**

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min Control rod travel mm	Control rod travel mm rev/min	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
ca. 53	1120 1160 1210 1270	12,3-13,0 6,6-11,2 0 - 6,0 0	ca. 30	420 500 650 1100	9,2-13,0 4,2- 8,4 0,5- 1,5 0,5- 1,5	ca. 13	200 300 400 530	7,9-9,7 6,0-8,3 3,1-5,7 0	250 600 1120 1270- 1350	0,2-1,2 5,9-6,1 6,0 end (11)
						3a				

Torque control travel a = mm

**C. Settings for Fuel Injection Pump with Fitted Governor**

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational-speed limitation intermediate speed		Fuel delivery characteristics high idle speed		Starting fuel delivery idle switching point		Torque-control travel	
rev/min	cm <sup>3</sup> /1000 strokes	rev/min	cm <sup>3</sup> /1000 strokes	rev/min	cm <sup>3</sup> /1000 strokes	rev/min	cm <sup>3</sup> /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	
See page 1!									

Checking values in brackets

\* 1 mm less control rod travel than col. 2

**B. Governor Settings**

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min Control rod travel mm	Control rod travel mm rev/min	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
						3a				

Torque control travel a = mm

**C. Settings for Fuel Injection Pump with Fitted Governor**

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational-speed limitation intermediate speed		Fuel delivery characteristics high idle speed		Starting fuel delivery idle switching point		Torque-control travel	
rev/min	cm <sup>3</sup> /1000 strokes	rev/min	cm <sup>3</sup> /1000 strokes	rev/min	cm <sup>3</sup> /1000 strokes	rev/min	cm <sup>3</sup> /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	

Checking values in brackets

\* 1 mm less control rod travel than col. 2

Testoil-ISO 4113

# Test Specifications Fuel Injection Pumps ② and Governors

En

PE 6 P 100/720 RS15, Z, Y, X  
A

RQ250/1100 PA43D, 111D

supersedes 5.71

RQ300/1100 PA111D

company:

Daimler Benz

RQ250/1125 PA216D

engine:

OM 355

PE 6 P 100/720 RS 5, Z

RQ250/1100 PA44D, 138D

PE 6 P 100/720 RS 188(V9594)

RQ300/1100 PA148D(V105C7D)

(V10549D)

OM 355 with RQV-governors MB 11,8 c

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

## A. Fuel Injection Pump Settings

Port closing at prestroke 2,8 + 0,1 mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm <sup>3</sup> /100 strokes 3	Difference cm <sup>3</sup> /100 strokes 4	Control rod travel mm 2	Fuel delivery cm <sup>3</sup> /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
	9	5,9 - 6,7	0,5			
1000	6 12	2,6 - 3,4 9,3 - 10,3				
200	9	2,5 - 3,3				

Adjust the fuel delivery from each outlet according to the values in .

## B. Governor Settings

RQ .. PA43D, 44D, 148D

Checking of slider FRG check rev/min 1		Full-load speed regulation Setting point rev/min 3		Test specifications Control rod travel mm 5		Idle speed regulation Setting point rev/min 7		Test specifications Control rod travel mm 10		Torque control rev/min 11		Control rod travel mm 12
	Control rod travel mm 2		Control rod travel mm 4		rev/min 6		Control rod travel mm 8		rev/min 9			
600	15,7-16,3	600	16,0	1120 1150 1200 1250	15,6-16,0 9,8-14,6 0 - 7,3 0	560	0	150 250 350 460	6,5-8,1 4,6-6,9 2,2-4,2 0	-	-	

Torque-control travel  
on flyweight assembly dimension a = 0 mm

Speed regulation: At

1 mm less control  
rod travel

## C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F) rev/min 1		Control rod stop rev/min 3		Fuel delivery characteristics rev/min 4		Starting fuel delivery Idle speed rev/min 6		Control rod travel mm 7
	cm <sup>3</sup> /1000 strokes 2				cm <sup>3</sup> /1000 strokes 5			cm <sup>3</sup> /1000 strokes/mm
Pe 5	with governors 44D, Pe 15 with governors 43D, Pe 188 with governors 148D:							
1090	117,0-120,0	500	900	115,0-119,0	100	140 - 160		
			700	113,5-117,0				
			450	103,5-108,5	800	80 - 84		
			(Reduced delivery → S188 with governors 148D)					
1090	68,0- 70,0	500	700	61,0- 64,0	100	14-16		
			450	56,0- 60,0				
								./.

Checking values in brackets

(increase by ± 1 cm<sup>3</sup>)

4.73

Testoil-ISO 4113

## B. Governor Settings

MB 11,8 a

-2-

Checking of slider PRG check		Full-load speed regulation				Idle speed regulation				Torque control	
①		Setting point		Test specifications		Setting point		Test specifications		③	
rev/min	Control rod travel mm	rev/min	Control rod travel mm	Control rod travel mm	rev/min	rev/min	Control rod travel mm	rev/min	Control rod travel mm	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	10	11	12
250/1100 PA111D	1050 14,8-15,6	1050	15,2	1100 14,8-15,2	1150 8,0-12,7	570	0	150 7,2-8,1	250 5,5-7,6	*	= 0,25 mm
				1200 0 - 7,6	1260 0			350 2,6-5,0	470 0	500	15,7-16,4
300/1100 PA111D	1050 14,8-15,6	1050	15,2	1100 14,8-15,2	1150 8,0-12,7	570	0	150 7,2-8,1	250 5,5-7,6	*	= 0,25 mm
				1200 0 - 7,6	1260 0			350 2,6-5,0	470 0	500	15,7-16,5

300/1100 PA148D

600 15,7-16,3

600

16,0

1120

15,6-16,0

560

0

150

6,5-8,1

\* = 0 mm

1150

9,8-14,6

250

4,6-6,9

1200

0 - 7,3

350

2,2-4,2

1250

0

460

0

250/1125 PA216D

660 15,7-16,3

600

16,0

1140

15,6-16,0

550

0

200

7,0-8,0

\* = 0 mm

1180

9,2-14,0

300

4,5-6,7

1220

0 - 9

400

0 - 2,8

1280

0

450

0

\* torque-control travel Maß a =

Testoil-ISO 4113

## B. Governor Settings

Checking of slider PRG check		Full-load speed regulation				Idle speed regulation				Torque control	
①		Setting point		Test specifications		Setting point		Test specifications		③	
rev/min	Control rod travel mm	rev/min	Control rod travel mm	Control rod travel mm	rev/min	rev/min	Control rod travel mm	rev/min	Control rod travel mm	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	10	11	12

Torque-control travel  
on flyweight assembly dimension a =

mm

Speed regulation At

1 mm less control  
rod travel

## C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F)		Control rod stop		Fuel delivery characteristics		Starting fuel delivery Idle speed	
②		③a		③b		⑥	
rev/min	cm <sup>3</sup> /-1000 strokes	rev/min		rev/min	cm <sup>3</sup> /-1000 strokes	rev/min	Control rod travel mm
1	2	3		4	5	6	7
1090	82,0-84,0	500		700	69,5 - 72,5		
				450	63,0 - 67,0		
1090	89,5-84,0	500		700	80,0 - 82,5		
				450	72,5 - 77,0		
1090	100,5-103,5	500		900	95,5 - 99,5		
				700	96,5 - 100,5		
				450	88,5 - 93,5		
1125	126,5-128,5	500					

En Checking values in brackets

# Test Specifications Fuel Injection Pumps ② and Governors

En

PE 6 P 100/721 RS 116 RQ 250/1100 PA 69 D

RQV250/440-750/1100 PA 86 D

RQV250-750/1100 PA 178D

RQV-governors VDT-WPP 001/4, 6th supplement!

supersedes 3.69  
company: Büssing  
engine: S 12 D

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

## A. Fuel Injection Pump Settings

Port closing at prestroke  $3,2 + 0,1$  mm (from BDC)  $+0,15$   
 $-0,05$

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm <sup>3</sup> /100 strokes 3	Difference cm <sup>3</sup> /100 strokes 4	Control rod travel mm 2	Fuel delivery cm <sup>3</sup> /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	12	10,5-11,1	0,4			
600	9	5,9- 7,1				
600	12	9,6-11,2				
600	15	13,6-15,3				
200	9	1,9- 3,1				

Adjust the fuel delivery from each outlet according to the values in .

Testoil-ISO 4113

## B. Governor Settings

RQ ... 69 D

Checking of slider PRG check rev/min 1		Full-load speed regulation Setting point rev/min 3		Test specifications Control rod travel mm 5		Idle speed regulation Setting point rev/min 7		Test specifications Control rod travel mm 10		Torque control Control rod travel mm 12	
500	15,7-16,3	550	16,0	1120	14,8-15,2	520	0	150	6,5-8,1	850	15,8-16,0
				1150	10,3-14,1			250	4,5-6,7		
				1200	0 - 8,7			350	1,1-3,1	1000	15,2-15,4
				1260	0			420	0		

Torque-control travel  
on flyweight assembly dimension a =

mm

Speed regulation: At

1 mm less control  
rod travel

## C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F) rev/min 1		Control rod stop rev/min 3		Fuel delivery characteristics rev/min 4		Starting fuel delivery Idle speed rev/min 6	
	cm <sup>3</sup> /1000 strokes 2				cm <sup>3</sup> /1000 strokes 5		Control rod travel mm 7
1100	118,0-121,0	500		800	120,5-124,5	100	16-19
				500	111,5-115,5		

Checking values in brackets

12.74

## B. Governor Settings

RQV .. 86 D

BOS 12,3 b

-2-

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
ca .66	1100 1150 1200 1270	12,0-14,7 6,5- 9,9 0 - 6,7 0	ca .47	650 800 900 1060	12,6-14,5 4,8- 6,8 0,6- 1,0 0	ca .10	200 300 450 610	6,1-8,0 3,0-4,0 1,6-2,8 0	350 600 900- 1000 1100	2,1-2,4 3,8-4,2 7,4-7,6 8,7
		0		n = 800 U/min						

Torque control travel a = 0,4 mm n = 500 U/min

## C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational-speed limitation intermediate speed		Fuel delivery characteristics high idle speed		Starting fuel delivery idle switching point		Torque-control travel	
rev/min	cm <sup>3</sup> /1000 strokes	rev/min	cm <sup>3</sup> /1000 strokes	rev/min	cm <sup>3</sup> /1000 strokes	rev/min	cm <sup>3</sup> /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	
1100	118,0-121,0	1120-1140	800 500	120,5-124,5 111,5-115,5	100	ca .19			

Checking values in brackets

\* 1 mm less control rod travel than col. 2

## B. Governor Settings

RQV .. 178 D

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
ca .68	1100 1150 1200 1260	14,0-16,0 7,3-12,4 0- 7,3 0	ca .62	700 800 860 1100 1150	11,3-14,0 2,2- 5,4 0,6- 1,0 0,5- 1,0 0	ca .12	200 300 400 470	7,0-8,0 5,1-7,3 1,5-3,7 0	450 700 950- 1100	3,2-4,3 6,3-6,8 8,5
		0 mm		n = 700 U/min						

Torque control travel a = 0,4 mm n = 500 U/min

## C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational-speed limitation intermediate speed		Fuel delivery characteristics high idle speed		Starting fuel delivery idle switching point		Torque-control travel	
rev/min	cm <sup>3</sup> /1000 strokes	rev/min	cm <sup>3</sup> /1000 strokes	rev/min	cm <sup>3</sup> /1000 strokes	rev/min	cm <sup>3</sup> /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	
1100	122,5-124,5	1120-1140	700 500	118,0-122,0 110,5-115,5	100	20 - 22			
						Change-over point 200-130 U/min			

Checking values in brackets

(increase by ± 1,0 cm<sup>3</sup>!) \* 1 mm less control rod travel than col. 2

Testoil-ISO 4113

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

# Test Specifications Fuel Injection Pumps ② and Governors

VDT-WPP 001/4 HEN 12,0 b  
Edition 3.72

En

PE 6 P 100/821 LS 80, X, Z  
(A) LS 80, Y  
LS 80, W, U  
LS 89, Y  
LS8D

RQ 250/1075 PA 135 DR  
RQ 250/1075 PA 126 DR  
RQV250-1075 PA 68 R  
RQV250-1075 PA 161 DR  
EP/RSV P1/6D 7D, 8 DR

supersedes 6.70  
company: Henschel  
engine: 524-...  
6 R 1315-..)

See page 2!

(V10434D, 10435D, 10652D, 10654D, 10678D)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

## A. Fuel Injection Pump Settings

Port closing at prestroke 3,0 + 0,1 mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm <sup>3</sup> /100 strokes 3	Difference cm <sup>3</sup> / 100 strokes 4	Control rod travel mm 2	Fuel delivery cm <sup>3</sup> /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	12	10,4 - 11,2	0,5			
600	9	5,1 - 5,9				
600	12	9,8 - 10,8				
600	15	13,8 - 15,0				
200	9	3,3 - 4,1				

Adjust the fuel delivery from each outlet according to the values in .

## B. Governor Settings

RQ 250/1075 PA 135 D (V10434D)

Checking of slider PRG check		Full-load speed regulation				Idle speed regulation				Torque control	
①		Setting point		Test specifications		Setting point		Test specifications		③	
rev/min 1	Control rod travel mm 2	rev/min 3	Control rod travel mm 4	Control rod travel mm 5	rev/min 6	rev/min 7	Control rod travel mm 8	rev/min 9	Control rod travel mm 10	rev/min 11	Control rod travel mm 12
** 600	15,7-16,3	600	16,0	1090	15,6-16,0	560	0	150	6,5-8,1		
				1150	7,0-12,5			250	4,8-7,0		
				1200	0 - 7,2			350	2,1-4,6		
				1270	0			460	0		
*** 600	15,7-16,3	600	16,0	1090	14,3-14,7	560	0	150	6,5-8,1	650	15,8-16,0
				1150	6,0-12,0			250	4,9-7,0	800	14,7-15,0
				1200	0 - 6,4			350	2,0-4,5		
				1260	0			460	0		

Torque-control travel  
on flyweight assembly dimension = \*\*0 mm, \*\*\* 0,4 mm

RQ .. PA 136 D (V10435D)

Testoil-ISO 4113

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	Torque-control travel mm
1	2	3	4	5	6	7	8	9	10	11

250-1075 PA 68 R

ca.68 1075 15,0-18,3 - - - ca.15 150 8,7-10,2

1150 8,2-13,2

1230 0 - 7,2

1320 0

250-1075 PA 161 DR (V10678D)

Torque-control travel a = 0,3 mm

ca.68 1075 15,0-18,3

1150 8,2-13,2

1230 0 - 7,4

1320 0

ca.15 150 8,7-10,2

250 5,6-6,2

350 3,0-4,3

500 0,5-2,3

630 0

(1A) 300-850 P1/6D (V 10652D)

ca.51 850 16,0

900 12,4

980 5,0

930 8,6-11,0

1000 2,5-5,0

1120 0 - 1

350-950 P1/7D (V10653D)

ca.53 950 16,0

1000 11,2

1050 5,2

1000 10,3-12,3

1100 1,3-3,8

1180 0 - 1

350-1100 P1/8D (V 10654D)

ca.69 1100 16,0

1160 11,6

1230 5,0

1170 9,8-11,8

1250 2,5-5,2

1360 0 - 1

ca.28 300 6,0

100 19 - 21

300 5,7-6,3

400 2,0-3,4

530 0 - 1

ca.27 350 6,0

100 19 - 21

350 5,7-6,3

450 1,6-3,0

560 0 - 1

ca.33 350 6,0

100 19 - 21

350 5,7-6,3

450 1,5-2,8

560 0 - 1

Special setting of governor RQV 250-1075 PA 161D (double idle spring):  
PA68R

1. The governor spring set may only be pretensioned by max. 1.0 mm (2 detents) per side.
2. When setting the governor, the control lever must reach the max. stop, so as to ensure that a high ratio is attained at the plate cam and variable-fulcrum lever.
3. The breakaway speed is attained by inserting the shim 1 420 101 622 beneath the inner spring.
4. In order to obtain the desired control-rod travel at  $n = 200 \text{ min}^{-1}$ , shims 2 420 102 003 must be optionally positioned on the lower idle spring.

Pay attention to switching point of automatic control-rod stop at  $n = 200-130^{-1}$ . (RQV)

The breakaway of the RO governor is to be set such that the full-load control-rod travel has decreased by 0.6 - 0.8 mm at  $n = 1115 \text{ min}^{-1}$ .

Testoil-ISO 4113

**C. Settings for Fuel Injection Pump with Fitted Governor**

Testoil-ISO 4113

Full-load delivery Test oil temp 40°C (104°F)		Rotational-speed limitation RQV	Fuel delivery characteristics		Starting fuel delivery	
rev/min	cm³/1000 strokes	Control-rod stop RQ	rev/min	cm³/1000 strokes	rev/min	cm³/1000 strokes
1	2	3	4	5	6	7

524 - 24 Pe S80 + RQ .. PA 135DR - 240 PS-  
Pe S80W + RQV .. PA 68 R

1075 140,5 - 143,5 600 (RQ) 600 133,0-137,0 100 ca.19  
1095 (RQV)

524 - 23 Pe S80X + RQ .. PA 135DR - 230 PS-  
Pe S80V + RQV .. PA 68R

1075 128,0 - 131,0 600 (RQ) 600 123,0-127,0 100 ca.17  
1095 (RQV)

524 - 21 Pe S80Z + RQ .. PA 135DR - 215 PS-  
Pe S80U + RQV .. PA 68R

1075 115,5 - 118,5 600 (RQ) 600 110,0-114,0 100 ca.15  
1095 (RQV)

524 - 20 Pe S80Y + RQ .. PA 136DR - 200 PS -  
Pe S80Y + RQV .. PA 161DR

1075 108,0 - 111,0 600 (RQ) 600 99,5-103,5 100 ca.15 - 17  
103,0 - 106,0 1095 (RQV)

524 - 18 Pe S80 + RQ .. PA 136DR - 186 PS -  
Pe S80 + RQV .. PA 161DR

1075 93,0 - 95,0 600 (RQ) 800 85,0 - 89,0 100 ca.15  
1095 (RQV) 600 88,0 - 94,0

Pe S 80 + EP/RSV .. 1/6 D - 150 PS-

850 90,0 - 92,0 870 (RSV) 500 93,0 - 97,0 100 ca.15

Pe S 80 + EP/RSV .. 1/7D - 164 PS -

950 93,0 - 95,0 970 (RSV) 500 97,0 -101,0 100 ca.15

Pe S 80 + EP/RSV .. 1/8D - 176 PS -

1100 99,0 - 102,0 1120 (RSV) 800 95,0 - 99,0 100 ca.15  
500 97,0 -101,0

(increase by  $\pm 1,0 \text{ cm}^3$ !)



# Test Specifications Fuel Injection Pumps ② and Governors

VDT-WPP 001/4 DAI 10,8 n  
Edition 2.64

En

PE 6 P 100/720 RS 15  
5  
4

RQ 250/1100 P 6 D  
P 9 D

supersedes

company:

Daimler-Benz

engine:

OM 346

(210 PS)

Special notes on testing see page 2!

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

## A. Fuel Injection Pump Settings

Port closing at prestroke

mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm <sup>3</sup> /100 strokes 3	Difference cm <sup>3</sup> /100 strokes 4	Control rod travel mm 2	Fuel delivery cm <sup>3</sup> /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	12	9,3 - 10,3				
	6	2,6 - 3,4				
	9	5,9 - 6,7				
	9	2,5 - 3,3				
200	12	6,3 - 7,1				

Adjust the fuel delivery from each outlet according to the values in .

Testoil-ISO 4113

## B. Governor Settings

Checking of slider PRG check rev/min 1		Full-load speed regulation Setting point rev/min 3				Idle speed regulation Setting point rev/min 7				Torque control rev/min 11	
Control rod travel mm 2		Test specifications Control rod travel mm 4		rev/min 6		Test specifications Control rod travel mm 8		rev/min 9		Control rod travel mm 12	
1050	14,9-15,7	1050	15,3	1110	15-15,3	500	0	100	7,0-8,0	700	16,0
				1150	9,2-12,8			200	6,7-7,6	800	15,6-15,9
				1200	3,0- 5,0			250	6,0-6,6	900	15,3-15,6
				1260	0			300	4,5-5,4	1000	15,3
								400	0,7-2,4		
								460	0		

Torque-control travel  
on flyweight assembly dimension a = 0,2 mm

Speed regulation: At

1 mm less control  
rod travel

## C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F) rev/min 1		Control rod stop rev/min 3		Fuel delivery characteristics rev/min 4		Starting fuel delivery Idle speed rev/min 6	
cm <sup>3</sup> /-1000 strokes 2		Control rod travel mm 3a		cm <sup>3</sup> /-1000 strokes 5		Control rod travel mm 7	
1090	100,5-102,0	500		900	98,5-100,5	100	15,0-16,0 (ca. RW 19 mm) Idle delivery 2,1 - 2,3
				700	99,5-102,0		
				450	87,5- 91,0		

Checking values in brackets

## Special notes on testing

1. Testing is performed with inertia flywheel EPKG 4 P 1 Z and flushing of the suction chamber. (Inlet on back of pump at boss of first pump barrel viewed from drive end. Return via overflow valve EPVE 176 P 2 likewise on back of pump at boss of sixth barrel.)

2. Basic setting of governor:

Breakaway not before  $n = 1100 \text{ min}^{-1}$ . The control-rod travel must not exceed 8 mm at  $n = 1200$ .

3. Idle-speed regulation:

Test whether control-rod travel 6.0-6.6 is obtained at  $n = 250 \text{ min}^{-1}$  (value in box, Section B, columns 9 and 10) and whether the control-rod travel is increased by min. 1.5 mm when reducing speed to  $n = 100 \text{ min}^{-1}$ .

4. Setting full-load delivery:

After setting at  $n = 1090 \text{ min}^{-1}$  care is to be taken to ensure that at  $n = 1125-1130 \text{ min}^{-1}$  the full-load control-rod travel is not regulated by more than 1 mm. After increasing speed to  $n = 1200 \text{ min}^{-1}$ , the control-rod travel must be 3 - 5 mm (value in box, Section 8, columns 5 and 6). If this is not the case, adjust governor spring and check idle-speed regulation again, item 3.

5. Setting control-rod stop:

With lever position determined as per item 4, reduce speed to  $n = 500 \text{ min}^{-1}$  and read off control-rod travel. Then set stop such that at  $n = 400 \text{ min}^{-1}$  the control-rod travel is the same as before at  $n = 500 \text{ min}^{-1}$ . The stop is to be set very "sensitively" so that the full-load/torque-control profile as of  $n = 700 \text{ min}^{-1}$  is not influenced by excessive pressing on. Particular attention is to be paid to the proper functioning and freedom of movement of the stop.

6. Starting fuel delivery:

Replace guide bushing EPMB 61 P 2 ... 6 X accordingly if the values as per Section C, column 7 (top) are not attained.

①

# Test Specifications Fuel Injection Pumps ① and Governors

40

VDT-WPP 001/4 BOS 12,3 e

1. Edition

En

PE 6 P 110/721 RS 168  
PE 6 P 110/721 RS 168

RQV 250-800/1100 PA 150 D (1)  
RQV 250-800/1100 PA 166 (2)

supersedes

company:

Büssing

engine:

S 12 ..

..A..

RQV-test-VDT-WPP 001/4, 6th supplement, see page 2!

DA 61 (310PS-1)

DA 61 (280PS-2)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

## A. Fuel Injection Pump Settings

Port closing at prestroke 2,8 + 0,1

mm (from BDC)

Cyl. 6

+0,15

( -0,05)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm <sup>3</sup> /100 strokes 3	Difference cm <sup>3</sup> / 100 strokes 4	Control rod travel mm 2	Fuel delivery cm <sup>3</sup> /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	12	13,8 - 14,5	0,6			
600	6	2,7 - 3,7				
600	12	13,0 - 14,5				
600	15	17,5 - 19,2				
200	6	0,4 - 1,3				

Adjust the fuel delivery from each outlet according to the values in .

## B. Governor Settings

RQV..PA 150 D (1)

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	mm 11
ca. 68	1100	14,0-16,0	ca. 62	700	14,5-17,0	ca. 12	150	6,4-8,0	200	0,2-1,3
	1150	7,0-12,4		800	6,8- 9,6		250	3,7-6,0	600	5,8-6,3
	1200	0- 7,2		900	0,6- 1,0		350	0,7-1,9	900-	
	1270	0		1100	0,6- 1,0		500	0	1100	8,5
		0	n =	1100	U/min	3a				
			n =	550	U/min					

Torque control travel a = 0,6 mm

## C. Settings for Fuel Injection Pump with Fitted Governor

(1)

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) ②		Rotational-speed limitation intermediate speed rev/min ④a	Fuel delivery characteristics ⑤a high idle speed ⑤c		Starting fuel delivery idle switching point ⑥		Torque-control ⑤	
rev/min 1	cm <sup>3</sup> /1000 strokes 2	rev/min 3	rev/min 4	cm <sup>3</sup> /1000 strokes 5	rev/min 6	cm <sup>3</sup> /1000 strokes 7	rev/min 8	Control rod travel mm 9
0,6	bar*		0,6	bar				
1100	180,0-182,0	1120	700	179,0-183,0	100	14 - 15		
0	bar		500	177,0-181,0				
1100	106,0-108,0							

Checking values in brackets

\* 1 mm less control rod travel than col. 2

12.74

Testoil-ISO 4113

**B. Governor Settings**

RQV .. PA 166 (2)

① Upper rated speed			Intermediate rated speed			④ Lower rated speed			③ Torque control	
Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	10	11
ca. 68	1100	14,0-16,0	ca. 62	700	14,0-17,0	ca. 12	150	6,4-8,0	200	0,2-1,3
	1150	7,0-12,4		800	6,8- 9,6		250	3,7-6,0	600	5,8-6,3
	1200	0 - 7,2		900	0,6- 1,0		350	0,7-1,9	900-	8,5
	1270	0		1100	0,6- 1,0		500	0	1100	
				1150	0					
⑤										

**C. Settings for Fuel Injection Pump with Fitted Governor**

② Full-load stop		⑥ Rotational-speed limitation Note: changed to ...) rev/min	③a Fuel delivery characteristics		Starting fuel delivery Idle		⑤a Idle stop	
Test oil temp. 40°C (104°F)			rev/min	cm <sup>3</sup> /1000 strokes	rev/min	cm <sup>3</sup> /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	
(2)	0,6 bar	1120	0	bar	100	26 - 28		
1100	155,0-157,0		1100	98,0-100,0				
			⑥a					

Checking values in brackets

\*1 mm less control rod travel than col. 2

**Setting LDA:**

1. Basic setting (Section A-B) without LDA
2. Full-load delivery (indication with charge-air pressure) at full-load stop screw of governor. Check fuel-delivery characteristics. Fit LDA.
3. Set start of adjustment at guide sleeve of diaphragm housing.
4. Full-load delivery (without charge-air pressure) at bell crank of LDA.
5. Check end of adjustment -  $n = 500 \text{ min}^{-1}$  - increasing pressure in bar:

Pump/governor	Start	End	Difference in control-rod travel
168/150 D	0 - 0.5	0.43-0.47	approx. 5.2 mm
168/166	0 - 0.7	0.52-0.56	approx. 3.8 mm

①

# Test Specifications Fuel Injection Pumps ① and Governors

40

VDT-WPP 001/4 MB 10,8 s

Edition 5.71

En

PE 6 P 100/720 RS 15 RQV 250-1100 PA45D, 108D, 146D (1) supersedes 10.69  
RQV 250-1100 PA46 (2) company: Daimler Benz  
PA94D, 116D (3) engine: OM 346(210)(1)  
..300-1100.. (185)(2)  
(192)(3)

The switching point is the locking and release of the automatic control-rod stop.

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

## A. Fuel Injection Pump Settings

Port closing at prestroke 2,8 + 0,1 mm (from BDC)

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm <sup>3</sup> /100 strokes	Difference cm <sup>3</sup> /100 strokes	Control rod travel mm	Fuel delivery cm <sup>3</sup> /100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	2	3	6
1000	9	5,9 - 6,7				
	6	2,6 - 3,4				
	12	9,3 - 10,3				
200	9	2,5 - 3,3				
	12	6,3 - 7,1				

Adjust the fuel delivery from each outlet according to the values in .

## B. Governor Settings

RQV 250-1100 PA45D, 46 (1, 2)

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
ca. 68	1100	15,0-18,0	-	-	-	ca. 10	200	6,5-8,0	1090	0
	1150	10,5-14,8					300	3,3-5,7	900	0,2-0,4
	1200	5,5-11,0					400	1,7-3,1	700	0,4-0,6
	1250	0 - 7,5					500	0 - 1,2	500	0,4-0,6
	1340	0					570	0	(- 45D)	

Torque control travel a = 0,5 mm für 45D; a = 0 für 46

## C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational speed limitation intermediate speed	Fuel delivery characteristics high idle speed		Starting fuel delivery idle switching point	Torque-control	
rev/min	cm <sup>3</sup> /1000 strokes	rev/min	rev/min	cm <sup>3</sup> /1000 strokes	rev/min	cm <sup>3</sup> /1000 strokes	rev/min
1	2	3	4	5	6	7	8
1090	100,5-102,0	1120	900	98,5-100,5	100	14 - 17	
			700	99,5-102,0	Change-over point		
			450	87,5- 91,0	250 Idle		
					= 200-130		
					300 Idle		
					= 250-180		

Checking values in brackets

\* 1 mm less control rod travel than col. 2

Testoil-ISO 4113

B14

344

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## B. Governor Settings

MB 10,8 s

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min Control rod travel mm	Control rod travel mm rev/min	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
RQV 300- ca.67	1100 1100 1150 1200 1250 1350	PA 45 D (1) 15,0-18,3 10,7-14,9 5,7-11,3 0- 7,6 0	-	-	-	ca.12	200 300 400 500 600	** 6,1-8,0 3,2-5,5 1,8-3,3 0-1,5 0	a = 0,5 mm 1090 900 700 500	5 mm 0 0,2-0,4 0,4-0,6 0,4-0,6
RQV 300- ca.67	1100 1100 1150 1200 1250 1350	PA 46 (2) 15,0-18,3 10,7-14,9 5,7-11,3 0- 7,6 0				(3a) ca.12	200 300 400 500 600	** 6,1-8,0 3,2-5,5 1,8-3,3 0-1,5 0	a = 0 mm -	-
RQV 300- ca.68	1100 1100 1150 1200 1230 1300	PA 108D, 146D (1) 14,0-17,0 9,0-13,5 2,5- 9,5 0- 6,8 0				ca.12	250 350 400 500 650	** 6,5-8,0 3,2-5,3 2,6-3,7 0,9-2,3 0	a = 0,5 mm - 1100 900 600	- 0 0,2-0,4 0,4-0,6
RQV 300- ca.67	1100 1100 1150 1200 1250 1350	PA 94D, 116D (3) 15,0-18,3 10,7-14,9 5,7-11,3 0- 7,6 0				ca.12	200 300 400 500 600	** 6,1-8,0 3,2-5,5 1,8-3,3 0-1,5 0	a = 1,2 mm 1100 800 500	0 0,9-0,5 1,1-1,3

\*\* Dimension

## B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min Control rod travel mm	Control rod travel mm rev/min	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
						(3a)				

Torque control travel a = mm

## C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational-speed limitation intermediate speed		Fuel delivery characteristics high idle speed		Starting fuel delivery idle switching point		Torque-control travel	
rev/min	cm <sup>3</sup> /1000 strokes	rev/min	cm <sup>3</sup> /1000 strokes	rev/min	cm <sup>3</sup> /1000 strokes	rev/min	cm <sup>3</sup> /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	
(2) 1090	89,5-91,0	1120	700	80,0-82,5 72,5-77,0	100	14 - 17			
(3) 1090	93,5-95,0	1120	900 600 450	91,5-94,0 96,5-99,0 89,5-92,5	100	14 - 17			

Checking values in brackets

\* 1 mm less control rod travel than col. 2

En

Testoil-ISO 4113

# Test Specifications

## Fuel Injection Pumps ②

### and Governors

VDT-WPP 001/4 MB 10,8 t

Edition 5.72

En

PE 6 P 100/720 RS 15 RQ 250/1100 PA 66 D (1)  
 (A) RQ 250/1100 PA 50 D (2)  
 EP/RSV250-900P1/303 (3-4)  
 RS 15 Z EP/RSV300-1100P1/303 (5)

supersedes DAI10,8t  
 company: (4.68)  
 engine: Daimler-Benz  
 OM 346  
 (192 PS - 1)  
 (230 PS - 2)  
 (165 PS - 3)  
 (175 PS - 4)  
 (OM 346/355 - 5\*)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

### A. Fuel Injection Pump Settings

Port closing at prestroke

mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm <sup>3</sup> /100 strokes 3	Difference cm <sup>3</sup> / 100 strokes 4	Control rod travel mm 2	Fuel delivery cm <sup>3</sup> /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	12	9,3 - 10,3	0,4			
	6 9	7,6 - 3,4 5,9 - 6,7				
200	9	2,5 - 3,3				

Adjust the fuel delivery from each outlet according to the values in 

Testoil-ISO 4113

### B. Governor Settings

RQ .. PA 66D (1)

Checking of slider PRG check		Full-load speed regulation				Idle speed regulation				Torque control	
Control rod travel mm		Setting point		Test specifications		Setting point		Test specifications		Control rod travel	
rev/min 1	2	rev/min 3	Control rod travel mm 4	Control rod travel mm 5	rev/min 6	rev/min 7	Control rod travel mm 8	rev/min 9	Control rod travel mm 10	rev/min 11	Control rod travel mm 12
1050	14,4-15	1050	14,7	1110 1150 1200 1260	14,4-14,7 10,0-13,5 3,0- 5,0 0	570	0	200 300 400 470	6.6-7,2 4,5-5,5 0,8-2,5 0	450 700 940	15,9-16,6 15,3-15,6 14,7-14,8

Torque-control travel  
on flyweight assembly dimension a = 0,4 mm

Speed regulation: At

1 mm less control  
rod travel

### C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F)		Control rod stop	Fuel delivery characteristics		Starting fuel delivery Idle speed	
rev/min 1	cm <sup>3</sup> /-1000 strokes 2	rev/min 3	rev/min 4	cm <sup>3</sup> /-1000 strokes 5	rev/min 6	cm <sup>3</sup> /1000 strokes/ Control rod travel mm 7
1090	93,5 - 95,0	500	900 600 450	91,5 - 94,0 96,5 - 99,0 89,5 - 92,5	100	14 - 17

Checking values in brackets

(increase by ± 1,0 cm<sup>3</sup>!)
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## B. Governor Settings

MB 10,8 t

-2-

Checking of slider PRG check		Full-load speed regulation				Idle speed regulation				Torque control	
		Setting point		Test specifications		Setting point		Test specifications			
rev/min	Control rod travel mm	rev/min	Control rod travel mm	Control rod travel mm	rev/min	rev/min	Control rod travel mm	Control rod travel mm	rev/min	Control rod travel mm	
1	2	3	4	5	6	7	8	9	10	11	12

250/1100 PA 50D (2)

torque-control travel Maß a = 0,3 mm

1050	14,7-15,3	1050	15,0	1100	14,9-15,0	560	0	150	7,0-8,0	700	15,9-16,0
				1120	14,3-15,0			200	6,6-7,6		
				1150	9,8-13,3			300	4,5-5,5	950	15,0-15,3
				1200	3,0- 5,0			400	0,7-2,5		
				1260	0			460	0		

## B. Governor Settings

EP/RSV

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel Torque-control travel	
Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11

250-900 P1/303 (3 - 4)

ca.46	900	16,0								
	950	9,5								
	980	4,5								
	950	8,2-10,8								
	1000	2,0- 4,0								
	1080	0 - 1								
			without auxiliary spring							
			with auxiliary spring							

ca.21	250	6,0								
	100	19 - 21								
	250	5,7-6,3								
	350	1,7-3,8								
	460	0 - 1								

300-1100 P1/303 (5)

ca.58	1100	16,0								
	1140	12,0								
	1180	7,0								
	1150	10,0-12,0								
	1200	3,8- 4,2								
	1340	0 - 1								
			without auxiliary spring							
			with auxiliary spring							

ca.23	300	7,5								
	200	19 - 21								
	300	7,2-7,8								
	400	3,3-4,2								
	550	0 - 1								

## C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp 40°C (104°F)		Control rod stop		Fuel delivery characteristics		Starting fuel delivery Idle speed	
rev/min	cm³/- 1000 strokes	rev/min		rev/min	cm³/- 1000 strokes	rev/min	cm³/1000 strokes / mm
1	2	3		4	5	6	7

Pump .. S15 with governor RQ .. PA 50 D (2)

1090	123.5 - 126.5	600 (RQ)	900	125.0 - 129.0	100	18 - 20.5
			700	122.5 - 126.5		
			450	116.5 - 121.5		

Pump ..S15 with governor 250-900 P1/303 (3 - continuous output 165 bhp)

880	93.0 - 96.0	910 (EP/RSV)				
Pump ..S15 with governor 250-900 P1/303 (4 - special output 175 bhp)						
880	99.0 -102.0	910 (EP/RSV)				

Pump ..S152 with governor 300-1100 P1/303 (5 - variable for 346/355\*)  
approx. 10 mm control-rod travel 1020 (EP/RSV)

\*Full-load and possibly engine-speed limitation is marked on nameplate of governor!



# Test Specifications Fuel Injection Pumps ② and Governors

VDT-WPP 001/4 MB 10,8 u  
2. Edition

En

PE 6 P 100/720 RS 15 RQ 250/1100 PA 81 D, 228 D\* (1) supersedes 5.71  
RS 5 RQ 250/1100 PA 82 D company: Daimler-Benz  
RS 15 RQV300-1100PA 75 (2) engine: OM 346  
RS 15 RQV300-1100PA 83D, 124D, 147D (3) (185 PS)

\*228 D-functional test of "rolling start disable": Set solenoid such that control rod is 1.5-2.5 mm before stop. RQV governor WPP 001/4, 6th Supplement !

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

## A. Fuel Injection Pump Settings

Port closing at prestroke 2,8 + 0,1 mm (from BDC) (-0,05)

Rotational speed	Control rod travel	Fuel delivery	Difference	Control rod travel	Fuel delivery	Spring pre-tensioning (torque-control valve)
rev/min	mm	cm <sup>3</sup> /100 strokes	cm <sup>3</sup> /100 strokes	mm	cm <sup>3</sup> /100 strokes	mm
1	2	3	4	2	3	6
1000	9	5,9 - 6,7	0,4			
	6	2,6 - 3,4				
	12	9,3 - 10,3				
200	9	2,5 - 3,3				

Adjust the fuel delivery from each outlet according to the values in  

Testoil-ISO 4113

## B. Governor Settings

RQ..PA 81 D, 82 D, 228 D\* (1)

Checking of slider PRG check		Full-load speed regulation				Idle speed regulation				Torque control	
①		Setting point		Test specifications		Setting point		Test specifications		③	
rev/min	Control rod travel mm	rev/min	Control rod travel mm	Control rod travel mm	rev/min	rev/min	Control rod travel mm	rev/min	Control rod travel mm	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	10	11	12
1050	14,7-15,3	1050	15,0	1120	14,6-15,0	560	0	150	7,0-8,0	500	16,0-16,3
				1150	10,0-13,4			250	5,9-6,5	580	15,7-16,0
				1200	1,0- 7,3			350	2,7-4,1	650	15,0-15,3
				1270	0			460	0		

Torque-control travel on flyweight assembly dimension a = 0,3 mm

Speed regulation: At

1 mm less control rod travel

## C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F)		Control rod stop	Fuel delivery characteristics		Starting fuel delivery Idle speed	
②		③a	③b		⑥	
rev/min	cm <sup>3</sup> /1000 strokes	rev/min	rev/min	cm <sup>3</sup> /1000 strokes	rev/min	cm <sup>3</sup> /1000 strokes/mm
1	2	3	4	5	6	7
1090	89,0 - 91,0 (88,0 - 92,0)	500	700	79,0 - 82,0 (78,0 - 83,0)	100	14 - 16
			450	79,0 - 83,0 (78,0 - 84,0)		
						./.

Checking values in brackets

5.74

## B. Governor Settings

RQV...PA 75 (2)

VDT-WPP 001/4 MB 10,8 u

-2-

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min Control rod travel mm	Control rod travel mm rev/min	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
ca .67	1100 1150 1200 1250 1350	15,0-18,3 10,7-14,9 5,7-11,3 0 - 7,6 0				ca .12	200 300 400 500 600	6,1-8,0 3,2-5,5 1,8-3,3 0 -1,5 0	1100	8,3
						(3a)				

Torque control travel a = mm

## C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational-speed limitation intermediate speed	Fuel delivery characteristics high idle speed		Starting fuel delivery idle switching point	Torque-control travel	
rev/min	cm <sup>3</sup> /1000 strokes	rev/min	rev/min	cm <sup>3</sup> /1000 strokes	rev/min	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8
1090	89,0-91,5	1140-1160**	700 450	79,5-83,0 72,5-77,0	100	14 - 16	To be specified by customer

Checking values in brackets

\* 1 mm less control rod travel than col. 2

## B. Governor Settings

RQV .. PA 83 D, 124 D, 147 D (3)

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min Control rod travel mm	Control rod travel mm rev/min	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
ca .67	1100 1150 1200 1250 1350	15,0-18,3 10,7-14,9 5,7-11,3 0 - 7,6 0	-	-	-	ca .12	200 300 400 500 600	6,1-8,0 3,2-5,5 1,8-3,3 0 -1,5 0	1000	8,3
						(3a)			S.U.	

Torque control travel a = 0 mm  
n = 1100 U/min  
0,7 mm n = 500 U/min

## C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational-speed limitation intermediate speed	Fuel delivery characteristics high idle speed		Starting fuel delivery idle switching point	Torque-control travel	
rev/min	cm <sup>3</sup> /1000 strokes	rev/min	rev/min	cm <sup>3</sup> /1000 strokes	rev/min	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8
1090	89,0-91,0	1140-1160**	700 500	79,0-82,0 79,0-83,0	100	14 - 16 Change-over point 250-180 U/min	

Checking values in brackets

\* 1 mm less control rod travel than col. 2

Testoil-ISO 4113

# Test Specifications Fuel Injection Pumps ② and Governors

VDT-WPP 001/4 HEN 12,0 a  
Edition 10.69

En

PE 6 P 100/821 LS 80 RQ 250/1075 PA 49 D  
..S 80Z, Y, X RQV 250-1075 PA 57 R  
RQV 250-1075 PA 68 R\*

supersedes 1.68  
company: Henschel  
engine: 523-23 (1)  
-21 (2)  
-20 (3)  
-18 (4)

\* Special setting of governor see page 3!

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

## A. Fuel Injection Pump Settings

Port closing at prestroke 3,0 + 0,1 mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm <sup>3</sup> /100 strokes 3	Difference cm <sup>3</sup> /100 strokes 4	Control rod travel mm 2	Fuel delivery cm <sup>3</sup> /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	12	10,4 - 11,2	0,5			
600	9	5,1 - 5,9				
600	12	9,8 - 10,8				
600	15	13,8 - 15,0				
200	9	3,3 - 4,1				

Adjust the fuel delivery from each outlet according to the values in

Testoil-ISO 4113

## B. Governor Settings

RQ 250/1075 PA 49 D

Checking of slider PRG check		Full-load speed regulation				Idle speed regulation				Torque control	
Setting point		Test specifications				Test specifications				Control rod travel	
rev/min 1	Control rod travel mm 2	rev/min 3	Control rod travel mm 4	Control rod travel mm 5	rev/min 6	rev/min 7	Control rod travel mm 8	rev/min 9	Control rod travel mm 10	rev/min 11	Control rod travel mm 12
600	15,7-16,3	600	16,0	1080	15,6-16,0	580	0	150	7,1-8,1	-	-
Breakaway not before n = 1085-1090				1100	12,5-15,8			250	5,5-7,5		
				1150	4,0-11,0			350	2,8-5,2		
				1180	0 - 8,0			480	0		
				1250	0						

Torque-control travel  
on flyweight assembly dimension a =

mm

Speed regulation: At

1 mm less control  
rod travel

## C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F)		Control rod stop		Fuel delivery characteristics		Starting fuel delivery Idle speed	
rev/min 1	cm <sup>3</sup> /1000 strokes 2	rev/min 3		rev/min 4	cm <sup>3</sup> /1000 strokes 5	rev/min 6	cm <sup>3</sup> /1000 strokes/mm 7
(1) S 80 - 230 PS				800	131,0-135,0	100	17,5 - 20,0
1075	131,5 - 134,5	550		600	129,5 - 134,5		
(2) S 80Z- 215 PS				800	120,0 - 124,0	100	17,0 - 19,5
1075	121,5 - 124,5	550		600	116,5 - 121,5		
(3) S 80Y- 200 PS				800	105,0 - 109,0	100	16,0 - 18,5
1075	107,5 - 110,5	550		600	103,5 - 108,5		
(4) S 80X- 180 PS				800	83,0 - 87,0	100	13,0 - 15,5
1075	91,5 - 94,5	550		600	76,5 - 81,5		

Checking values in brackets

**B. Governor Settings**

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min Control rod travel mm	Control rod travel mm rev/min	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
ca. 66	1075 1100 1150 1220 1300	15,0-17,6 12,5-16,0 7,4-12,4 0 - 6,8 0	-	-	-	ca. 10	150 250 350 500 680	7,0-8,0 4,2-6,5 2,4-3,8 1,2-2,6 0		
						(3a)				

Torque control travel a = mm

**C. Settings for Fuel Injection Pump with Fitted Governor**

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational-speed limitation intermediate speed	Fuel delivery characteristics high idle speed		Starting fuel delivery idle switching point	Torque-control travel	
rev/min	cm <sup>3</sup> /1000 strokes	rev/min	rev/min	cm <sup>3</sup> /1000 strokes	rev/min	rev/min	Control rod travel mm
1	2	3	4	5	6	7	9
1075	131,5-134,5	1085-1090	800 600	131,0-135,0 129,5-134,5			

Checking values in brackets

\* 1 mm less control rod travel than col. 2

**Testoil-ISO 4113****D. Adjustment Test for Manifold Pressure Compensator**Test at n = rev/min decreasing pressure - in bar gauge pressure  
increasing

Pump/governor	Setting	Measurement	Control rod travel- diminution difference
	Gauge pressure = bar	Gauge pressure = bar	mm

En

**B. Governor Settings**

RQV 250-1075 PA 68 R

① Upper rated speed			Intermediate rated speed			④ Lower rated speed			③ Torque control	
Degree of deflection of control lever	rev/min	Control rod travel	Degree of deflection of control lever	rev/min	Control rod travel	Degree of deflection of control lever	rev/min	Control rod travel	rev/min	Control rod travel
1	2	3	4	5	6	7	8	9	10	11
ca. 68	1075	15,0-18,3				ca. 15	150	8,7-10,4		
	1150	8,2-13,2					250	5,6-6,2		
	1230	0 - 7,4					350	3,0-4,3		
	1320	0					500	0,5-2,3		
⑤							630	0		

**C. Settings for Fuel Injection Pump with Fitted Governor**

② Full-load stop		⑥ Rotational-speed limitation		③a Fuel delivery characteristics		Starting fuel delivery Idle		⑤a Idle stop	
Test oil temp. 40°C (104°F)		Note: changed to ...)							
rev/min	cm <sup>3</sup> /1000 strokes	rev/min		rev/min	cm <sup>3</sup> /1000 strokes	rev/min	cm <sup>3</sup> /1000 strokes	rev/min	Control rod travel mm
1	2	3		4	5	6	7	8	

Full load in accordance with pump index as per page 1 - 2 100 18 - 19

\* Special setting of governor RQV 250-1075 PA 68 R (double idle spring):

1. The governor spring set may only be pre-tensioned by 1.0 mm (2 detents) per side.
2. When setting the governor, the control lever must attain max. deflection, in order to achieve a high ratio at the plate cam and variable-fulcrum lever.
3. The breakaway speed is obtained by inserting the shim 1 420 101 622 beneath the inner spring.
4. Shims 2 420 102 003 must be placed as required on the lower idle spring, so as to achieve the desired control-rod travel at  $n = 200 \text{ min}^{-1}$ .

Testoil-ISO 4113

# Test Specifications Fuel Injection Pumps ② and Governors

VDT-WPP 001/4 MB 10,8 p  
Edition 2.69

En

PE 6 P 100/720 RS 15 RQ 250/1100 P 18 D  
RS 152\*

Special notes on testing

See page 2!

supersedes DAI 10,8 p  
2.64  
company: Daimler-Benz  
engine: OM 346  
(155 PS)  
(145 PS)\*

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

## A. Fuel Injection Pump Settings

Port closing at prestroke  $2,8 + 0,1$  mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm <sup>3</sup> /100 strokes 3	Difference cm <sup>3</sup> /100 strokes 4	Control rod travel mm 2	Fuel delivery cm <sup>3</sup> /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	6	2,6 - 3,4				
	9	5,9 - 6,7				
	12	9,3 - 10,3				
200	9	2,6 - 3,3				
	12	6,3 - 7,1				

Adjust the fuel delivery from each outlet according to the values in .

Testoil-ISO 4113

## B. Governor Settings

Checking of slider PRG check		Full-load speed regulation				Idle speed regulation				Torque control	
①		Setting point		Test specifications		Setting point		Test specifications		③	
rev/min 1	Control rod travel mm 2	rev/min 3	Control rod travel mm 4	Control rod travel mm 5	rev/min 6	rev/min 7	Control rod travel mm 8	rev/min 9	Control rod travel mm 10	rev/min 11	Control rod travel mm 12
1050	14,1-14,9	1050	14,5	1100	14,3-14,5	500	0	150	7,0-8,0	550	15,7-16,0
				1120	11,8-14,5			200	6,6-7,6	700	15,2-15,6
				1150	7,0-11,9			250	5,8-6,6	900	14,6-15,0
				1200	3,0- 5,0			300	4,5-5,5	1000	14,5-14,6
				1260	0			400	0,7-2,4		
								460	0		

Torque-control travel  
on flyweight assembly dimension a =

mm

Speed regulation: At

1 mm less control  
rod travel

## C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F)		Control rod stop		Fuel delivery characteristics		Starting fuel delivery Idle speed	
②		③a		③b		⑥	
rev/min 1	cm <sup>3</sup> /1000 strokes 2	rev/min 3		rev/min 4	cm <sup>3</sup> /1000 strokes 5	rev/min 6	cm <sup>3</sup> /1000 strokes/mm 7
1090	76,5 - 78,0	500		900	73,5 - 76,0	100	14,0 - 16,0
				700	71,5 - 74,5		Idle delivery
				450	66,0 - 69,5	300	2,1 - 2,3
1090	69,0 - 71,0	500		700	62,0 - 65,0	100	14,0 - 16,0
				450	56,5 - 60,5	300	Idle
							2,1 - 2,3
							./.

Checking values in brackets

Special notes on testing

1. Testing is performed with the inertia flywheel EPKG 4 P 1 Z and flushing of the suction chamber. (Inlet on back of pump at boss of first pump barrel viewed from drive end; return via overflow valve EPVE 176 P 2 Z on back of pump at boss of sixth barrel).

2. Basic setting of governor:

Breakaway not before  $n = 1100 \text{ min}^{-1}$ . Control-rod travel must not exceed 8 mm at  $n = 1200 \text{ min}^{-1}$ .

3. Sequence of subsequent testing operations:

- a) Measure full load at  $n = 1090 \text{ min}^{-1}$  and fuel-delivery characteristics at  $n = 900$  and  $700 \text{ min}^{-1}$ .
- b) Position control-rod stop at  $n = 500 \text{ min}^{-1}$  such that control-rod travel is not cut off at  $n = 700 \text{ min}^{-1}$ .
- c) Measure delivery at  $n = 450 \text{ min}^{-1}$ .
- d) Measure delivery again at  $n = 700 \text{ min}^{-1}$  and establish whether delivery measured above (without control-rod stop) is attained again.

En

# Test Specifications Fuel Injection Pumps **(1A)** and Governors

**40**

VDT-WPP 001/4 PEN 10,0 a  
Edition 5.71

En

PE 6 P 100/320 RS 52	EP/RSV 200-900 P 4/305 R	(1)	supersedes	12.68
	200.1000P 4/306 R	(2)	company	Volvo-Penta
	200-900 P 4/309 R	(3)	engine	TD 100 A
	EP/RSUV200-900 P 0/306,319	(4)		TMD100 A
PE 6 P 100/320 RS 51	EP/RSV 200-900 P 1/305 R	(5)		D 100 A

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

## A. Fuel Injection Pump Settings

EP/RSV 250-1150P 5/305 R (6)

Port closing at prestroke

2,6 + 0,1

mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm <sup>3</sup> /100 strokes 3	Difference cm <sup>3</sup> /100 strokes 4	Control rod travel mm 2	Fuel delivery cm <sup>3</sup> /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	12	11,3-12,3	0,5			S52: 3,5±0,1
600	6	0,5- 1,2				max. 3,2-3,9
	9	4,6- 5,8				S51: 2,5±0,1
	12	10,8-12,2				max. 2,2-2,9
200	9	2,8- 4,0				

Adjust the fuel delivery from each outlet according to the values in

## B. Governor Settings

200-900 P4/305 R (1)

<b>(1)</b> Upper rated speed rev/min			Intermediate rated speed			<b>(4)</b> Lower rated speed			<b>(3)</b> Torque control	
Degree of deflection of control lever 1	Control rod travel mm 2	Control rod travel mm rev/min 3	4	5	6	Control-lever deflection in degrees 7	rev/min 8	Control rod travel mm 9	rev/min 10	Control rod travel mm 11
ca. 55	900	16,0	without auxiliary spring			ca. 25	200	6	900	0
	950	11,4					100	19 - 21		
	1000	4,0					200	5,7-6,3	350	0
<b>(2a)</b>	960	8,0-11,6	with auxiliary spring				250	3,0-4,4	250	1,2-1,8
	1000	2,0- 6,6					350	0-1		
	1100	0 - 1								

The numbers denote the sequence of the tests

## C. Settings for Fuel Injection Pump with Fitted Governor

<b>(2b)</b> Full-load stop		<b>(6)</b> Rotational-speed limit		<b>(3a)</b> Fuel delivery characteristics		Starting fuel delivery Idle		<b>(4a)</b> Idle stop	
Test oil temp. 40°C (104°F)		Note: changed to .)							
rev/min 1	cm <sup>3</sup> /1000 strokes 2	rev/min 3		rev/min 4	cm <sup>3</sup> /1000 strokes 5	rev/min 6	cm <sup>3</sup> /1000 strokes 7	rev/min 8	Control rod travel mm 9
(1)		910				200	12 - 15		
880	143,0-146,0					dispersion max. 1,5)*			
(2)		1020	1000	144 - 147**			** fuel overquantity		
980	135 - 138								
(3)		910	700	101 - 104		Idle:	dispersion max. 1,5 *		
980	143 - 146					200	12 - 15		
880	143 - 146	910							

Checking values in brackets

\* 1 mm less control rod travel than col. 2

\* In the case of greater dispersion alter the delivery-valve spring pre-tension accordingly.

**BOSCH**

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Testoil-ISO 4113



## B. Governor Settings

EP/RSV (40°) EP/RSUV (35°)

Upper rated speed				Intermediate rated speed			Lower rated speed			Sliding sleeve travel			
Degree of deflection of control lever	rev/min Control rod travel mm	Control rod travel mm rev/min	1a 2a	Degree of deflection of control lever	rev/min mm	Control rod travel mm	4	Degree of deflection of control lever	rev/min mm	Control rod travel mm	3	rev/min	1 mm
1	2	3		4	5	6		7	8	9		10	11
200-1000 ca.62	P 4/306 (2) 1000 1050 1100 1070 1100 1160	16,0 10,8 4,0 6,0-9,8 2,0-6,0 0,3-1,0		*		VH		= 40° ca.25	200 100 200 250 300 350	6,0 19,0-21,0 5,7- 6,3 3,0- 4,5 0 - 2,4 0 - 1,0	3a	980 320 240	0 0 1,2-1,8
200-900 ca.55	P 4/309 (3) 900 950 1000 970 1010 1070	16,0 11,2 4,3 6,4-10,3 1,0- 5,4 0 - 1		*		VH		= 40° ca.25	200 100 200 250 300 350	6,0 19,0-21 5,7-6,3 3,0-4,5 0- 2,3 0- 1,0		880 320 240	0 0 1,2-1,8
200-900 ca.47	P 0/306, 319 (4) 900 930 950 950 1000 1050	16,0 9,8 6,0 5,0-8,0 0,5-3,1 0 -1,0		*		VH		= 35° ca.13	200 100 200 250 350 420	8 19- 21 7,7-8,3 5,6-6,7 0 -3,1 0 -1		-	-

\* fuel overquantity

**\*\* without auxiliary  
spring**

\*\*\* with auxiliary  
spring

## B. Governor Settings

[illegible]

Torque control travel a = mm

### C. Settings for Fuel Injection Pump with Fitted Governor

[illegible]

### Checking values in brackets

\* 1 mm less control rod travel than col. 2

En

**Testoil-ISO 4113**

**B. Governor Settings**

① Upper rated speed rev/min			Intermediate rated speed			④ Lower rated speed			③ Torque control	
Degree of deflection of control lever	Control rod travel mm	Control rod travel mm rev/min				Control-lever deflection in degrees	rev/min	Control rod travel mm	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	10	11
ca. 50	900	16,0	without auxiliary spring			ca. 24	200	6	900	0
	950	12,0					100	19,0-21,0	350	0
	1000	6,6					200	5,7- 6,3	250	1,2-1,8
	980	7,2-10,2	with auxiliary spring							
	1020	1-6								
	1100	0-1								

Testoil-ISO 4113

**C. Settings for Fuel Injection Pump with Fitted Governor**

②b Full-load stop		⑥ Rotational-speed limitat.		③a Fuel delivery characteristics		Starting fuel delivery ⑤		④a Idle stop	
Test oil temp. 40°C (104°F)		Note: changed to ...)				Idle			
rev/min	cm³/1000 strokes	rev/min		rev/min	cm³/1000 strokes	rev/min	cm³/1000 strokes	rev/min	Control rod travel mm
1	2	3		4	5	6	7	8	9
880	111,0-113,0	910 - 920		600	102,0 - 106,0	200	12 - 15, dispersion max.	200	6,0
								1,5*	

Checking values in brackets

± 0,5 ccm

\* 1 mm less control rod travel than col. 2

**B. Governor Settings**

EP/RSV 250-1150 P 5/305 R (6)

① Upper rated speed rev/min			Intermediate rated speed			④ Lower rated speed			③ Torque control	
Degree of deflection of control lever	Control rod travel	Control rod travel				Control-lever deflection in degrees	rev/min	Control rod travel	rev/min	Control rod travel
1	mm	mm rev/min	4	5	6	7	8	mm	10	11
ca.64	1150	16,0	without auxiliary spring			ca.29	250	6,0	1130	0
	1250	10,9					150	19 - 21	500	0
	1350	4,4					250	5,7-6,3		
	1250	9,6-11,8	with auxiliary spring				350	1,7-3,7	300	1,2-1,8
	1250	2,5- 6,4					460	0 - 1		
	1500	0 - 1								

**C. Settings for Fuel Injection Pump with Fitted Governor**

②b Full-load stop		⑥ Rotational-speed limitat.		③a Fuel delivery characteristics		Starting fuel delivery ⑤		④a Idle stop	
Test oil temp. 40°C (104°F)		Note: changed to ...)				Idle			
rev/min	cm³/1000 strokes	rev/min		rev/min	cm³/1000 strokes	rev/min	cm³/1000 strokes	rev/min	Control rod travel mm
1	2	3		4	5	6	7	8	9
1150	93,0 - 95,0 (92,5 - 95,5)	1170		950	86,0-90,0 (85,5-90,5)			250	6,0

Checking values in brackets

\* 1 mm less control rod travel than col. 2

①

# Test Specifications Fuel Injection Pumps ① and Governors

40  
VDT-WPP 001/4 SCA 11,0 g  
Edition 10.69

En

PE 6 P 100/720 RS 82, Z...M RQV 250-...PA48R (1) supersedes 12.68  
RQV 250-1100 PA 85 R (2) company: Scania Vabis  
PE 6 P 100/720 RS 91, Z...M EP/RSV 350-1100 P1/310 R(3) engine: DS 11

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

## A. Fuel Injection Pump Settings

Port closing at prestroke 2,6 + 0,1 mm (from BDC) 2,4 + 0,1 ..S91Y

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm <sup>3</sup> /100 strokes 3	Difference cm <sup>3</sup> /100 strokes 4	Control rod travel mm 2	Fuel delivery cm <sup>3</sup> /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	12	12,6 - 13,2	0,6			3,5 ± 0,1 * (max.3,2-3,9)
600	6	1,1 - 1,9	Start-of-delivery test without - delivery test with Robodiaphragm! Manifold-pressure compensator and reduced full-load deliveries, page 4			
600	12	12,6 - 13,6				
600	15	17,8 - 19,1				
200	6	0,7 - 1,5				

Adjust the fuel delivery from each outlet according to the values in \_\_\_\_\_.

\* In the case of greater dispersion alter the delivery-valve spring pre-tension accordingly

## B. Governor Settings

250 - 1100 PA 48 R (1)

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	mm 11
ca. 68	1150	15,0-18,2	-	-	-	ca. 10	200	5,8-8,0	-	-
	1350	0 - 1,5					300	3,1-4,4		
ca. 62	1100	15,0-17,8					400	2,6-3,6		
	1150	10,2-13,8					500	1,8-3,0		
	1200	5,0-10,0					600	0,8-2,0		
	1250	0 - 3,2					780	0		
	1280	0				3a				

Torque control travel a = mm

## C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control rod stop Test oil temp. 40°C (104°F) ②		Rotational speed limitation intermediate speed ②b	Fuel delivery characteristics high idle speed ⑤b		Starting fuel delivery idle switching point ⑥		Torque-control travel ⑤	
rev/min 1	cm <sup>3</sup> /1000 strokes 2	rev/min 3	rev/min 4	cm <sup>3</sup> /1000 strokes 5	rev/min 6	cm <sup>3</sup> /1000 strokes 7	rev/min 8	Control rod travel mm 9
1100	144,0-146,0 (12,5 ± 0,5 mm RW)	charge-air pressure 0,4 1120 charge-air pressure 0	600	148,0-152,0	100	24 - 29		
			500	121,0-127,0	225	0,9-1,3		
					1200	3,9-4,4		
						dispersion max. 0,15)* dispersion max. 0,4)		
	(increase by ± 0,5 cm <sup>3</sup> !)							./.

Checking values in brackets

\* 1 mm less control rod travel than col. 2

Testoil-ISO 4113

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C7

C7

**B. Governor Settings**

1 Upper rated speed rev/min			Intermediate rated speed			4 Lower rated speed			3 Torque control	
Degree of deflection of control lever	Control rod travel mm	Control rod travel mm rev/min				Control-lever deflection in degrees	rev/min	Control rod travel mm	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	10	11
ca. 68	1100	15,0-18,3	-	-	-	ca. 12	150	7,0-8,0		
	1150	10,4-14,7					250	4,2-6,6		
	1200	5,3-11,0					400	2,0-3,3		
							500	0,5-2,0		
	1250	0 - 6,8					600	0		
2a	1330	0								

**C. Settings for Fuel Injection Pump with Fitted Governor**

2b Full-load stop		6 Rotational-speed limitat.		3a Fuel delivery characteristics		Starting fuel delivery Idle		5 Idle stop	
Test oil temp. 40°C (104°F)		Note: changed to ...)							
rev/min	cm³/1000 strokes	rev/min		rev/min	cm³/1000 strokes	rev/min	cm³/1000 strokes	rev/min	Control rod travel mm
1	2	3		4	5	6	7	8	9

Checking values in brackets

\* 1 mm less control rod travel than col. 2

**B. Governor Settings**

EP/RSV 350-1100 P1/310 R (3)

1 Upper rated speed rev/min			Intermediate rated speed			4 Lower rated speed			3 Torque control		
Degree of deflection of control lever	Control rod travel mm	Control rod travel mm rev/min				Control-lever deflection in degrees	rev/min	Control rod travel mm	rev/min	Control rod travel mm	
1	2	3	4	5	6	7	8	9	10	11	
ca. 62	1100	16,0	without auxiliary spring			ca. 29	350	6,0	1080	0	
	1150	11,8					100	19 - 21		500	0
	1200	5,8					350	5,7-6,3		380	1,2-1,8
	1150	10,5-12,6	with auxiliary spring				400	1,1-3,6			
	1200	3,5- 8,0					460	0 - 1			
2a	1320	0 - 1									

**C. Settings for Fuel Injection Pump with Fitted Governor**

2b Full-load stop		6 Rotational-speed limitat.		3a Fuel delivery characteristics		Starting fuel delivery Idle		5 Idle stop	
Test oil temp. 40°C (104°F)		Note: changed to ...)							
rev/min	cm³/1000 strokes	rev/min		rev/min	cm³/1000 strokes	rev/min	cm³/1000 strokes	rev/min	Control rod travel mm
1	2	3		4	5	6	7	8	9
1100	144,0-146,0	1120		600	148,0-152,0	1200	3,9 - 4,4 dispersion max.0,4	350	6,0

Checking values in brackets

\* 1 mm less control rod travel than col. 2

Testoil-ISO 4113

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel Torque-control travel	
Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11

**Testoil-ISO 4113**

250 - 700

68±1,5	800	14,0-17,0
	950	0 - 1,5
63±1,5	700	15,0-17,6
	750	7,5-13,0
	800	0 - 8,0
	870	0

- - -

10±1,5	180	6,4-8,0
	250	4,2-7,0
	320	2,6-3,8
	400	1,5-2,9
	520	0

- -

250 - 750

68±1,5	800	14,0-17,0
	950	0 - 1,5
66±1,5	750	15,0-18,0
	800	7,5-13,0
	900	0

- - -

10±1,5	180	6,4-8,0
	250	5,2-6,5
	320	2,4-3,8
	400	1,4-2,8
	520	0

- -

250 - 800

67±1,5	900	15,0-18,0
	1080	0 - 1,5
63±1,5	800	15,0-17,6
	850	10,0-14,0
	900	4,0-10,0
	1010	0

- - -

10±1,5	180	6,4-8,0
	250	4,2-6,5
	320	2,3-3,8
	450	1,0-2,3
	580	0

- -

250 - 850

67±1,5	900	15,0-18,0
	1080	0 - 1,5
65±1,5	850	15,0-18,0
	900	9,0-14,0
	950	1,0-10,0
	1040	0

- - -

10±1,5	180	6,5-8,0
	250	4,4-6,5
	320	2,2-3,8
	450	1,0-2,3
	570	0

- -

250 - 900

68±1,5	1000	15,0-18,2
	1200	0 - 1,5
64±1,5	900	15,0-18,0
	980	7,0-12,0
	1050	0 - 6,4
	1120	0

- - -

10±1,5	180	6,0-8,0
	250	4,0-6,2
	320	2,5-3,8
	450	1,5-2,7
	630	0

- -

250 - 950

68±1,5	1000	15,0-18,2
	1200	0 - 1,5
66±1,5	950	15,0-18,0
	1000	10,0-14,0
	1050	3,0-10,0
	1150	0

- - -

10±1,5	180	6,3-8,0
	250	4,3-6,5
	320	2,5-3,8
	450	1,4-3,0
	630	0

- -

250 - 1000

68±1,5	1150	15,0-18,2
	1360	0 - 1,5
63±1,5	1000	15,0-18,0
	1080	8,0-13,0
	1150	1,6- 8,6
	1270	0

- - -

10±1,5	180	6,4-8,0
	250	4,3-6,5
	320	2,8-3,8
	500	1,6-2,9
	720	0

- -

250 - 1050

68±1,5	1150	15,0-18,2
	1360	0 - 1,5
64±1,5	1050	15,0-17,6
	1120	9,0-13,3
	1200	0,5- 7,8
	1300	0

- - -

10±1,5	180	6,4-8,0
	250	4,3-6,5
	320	2,8-3,8
	500	1,5-4,0
	720	0

- -

Basic setting: horizontal position of cam (= without charge-air pressure) of full-load stop is to be set by way of stop screw in top of diaphragm housing.

Check: difference in control-rod travel between pressure-charging and induction = 1.4 mm - correct by changing shim beneath the spacer bushing in bottom of diaphragm housing.

Stop adjustment:

There must have been a 0.1 mm reduction in full-load control-rod travel at 0.27 - 0.29 kp/cm<sup>2</sup> (197 - 213 mm Hg) and 500 min<sup>-1</sup>.

There must have been a 1.3 mm reduction in full-load control-rod travel at 0.11 - 0.15 kp/cm<sup>2</sup> (82 - 112 mm Hg) and 500 min<sup>-1</sup>.

If these values are not attained, shims (as per service parts list) must be inserted beneath the helical spring in the diaphragm housing.

Reduced full-load deliveries

S 82.. S 91..	Full load in cm <sup>3</sup> /1000 strokes (tol. - 1.0)				Reduced control-rod travel mm
	/ n =				
	1100	900	750	600 U/min	+ 0,6 FB 2,4 ± 0,1
Y*	-	160	166	162	+ 0,6 FB 2,4 ± 0,1
X	136	141	144	138	- 0,6
Z	129	133	134	128	- 1,1
U	124	128	128	123	- 1,4
T	120	124	124	118	- 1,6
S	110	113	112	106	- 2,2
R	103	103	102	97	- 2,6
Q	94	94	91	86	- 3,1
P	86	85	81	75	- 3,6
O	79	75	70	64	- 4,1
N	73	67	61	53	- 4,5
M	69	61	53	44	- 4,8

\* Setting Y only for pump S 91.

①

# Test Specifications Fuel Injection Pumps ① and Governors

40

VDT-WPP 001/4 MB 10,8 r  
Edition 2.69

En

PE 6 P 100/720 RS 15  
Special notes on testing

RQV 250-1100 P 14 D  
P 15 D  
P 21 R

supersedes 2.64  
company: DAI 10,8 r  
engine: Daimler Benz  
OM 346  
(180 PS)

\* Refer to VDT-BMP 211/15 for testing of automatic control-rod stop

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

## A. Fuel Injection Pump Settings

Port closing at prestroke 2,8 + 0,1 mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm <sup>3</sup> /100 strokes 3	Difference cm <sup>3</sup> / 100 strokes 4	Control rod travel mm 2	Fuel delivery cm <sup>3</sup> /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	6	2,6 - 3,4				
	9	5,9 - 6,7				
	12	9,3 - 10,3				
200	9	2,5 - 3,3				
	12	6,3 - 7,1				

Adjust the fuel delivery from each outlet according to the values in .

## B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel ①	
Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	mm 11
ca. 66	1100 1120 1150 1200 1250 1300	15 - 17,8 12,6 - 16 9,5 - 13,7 3,2 - 9,6 0 - 5,2 0	-	-	-	ca. 10	150 250 350 500 600 730	7,5 - 8 5 - 7 3,4 - 3,8 2,2 - 3,8 1,1 - 2,4 0	-	-

Torque control travel a = mm

## C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) (2)		Rotational-speed limitation intermediate speed (2b)	Fuel delivery characteristics high idle speed (5b)		Starting fuel delivery idle switching point (6)		Torque-control travel (5)	
rev/min	cm³/1000 strokes	rev/min (4a)	rev/min	cm³/1000 strokes	rev/min	cm³/1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9
1090	89,5-91,0	1110-1120	700 450	80,0-82,5 72,5-77,0	100 Idle delivery 300 dispersion max.0,3)	14 - 16 2,1-2,3		Control lever

Checking values in brackets

\* 1 mm less control rod travel than col. 2

Testoil-ISO 4113

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Special notes on testing

1. Testing is performed with inertia flywheel  
EPKG 4 P 1 Z and flushing of suction chamber. (Inlet  
on back of pump at boss of first pump barrel viewed  
from drive end. Return via overflow valve  
EPVE 176 P 2 Z likewise on back of pump at boss of  
sixth barrel.)
2. Testing/adjustment of governor and full-load delivery  
as per WPP 001/4.



①

# Test Specifications Fuel Injection Pumps ① and Governors

40

VDT-WPP 001/4 MB 11,8 c

1. Edition

En

PE 6 P 100/720 RS 15, Z, Y RQV 300-1100 PA45D, 61D, 104D,  
A 108D, 146D, 198

supersedes

company: Daimler Benz  
engine: OM 355

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

## A. Fuel Injection Pump Settings

Port closing at prestroke  $2,8 \pm 0,1$  mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm <sup>3</sup> /100 strokes 3	Difference cm <sup>3</sup> /100 strokes 4	Control rod travel mm 2	Fuel delivery cm <sup>3</sup> /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	9	5,9-6,7	0,5			
	6 12	2,6-3,4 9,3-10,3				
200	9	2,5-3,3				

Adjust the fuel delivery from each outlet according to the values in  .

## B. Governor Settings

RQV .. PA45D

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	mm 11
ca. 67	1100 1150 1200 1250 1350	15,0-18,3 10,7-14,9 5,7-11,3 0 - 7,6 0	-	-	-	ca. 12	200 300 400 500 600	6,1-8,0 3,2-5,5 1,8-3,3 0 - 1,5 0	-	-
						③a			1100	8,4

Torque control travel a = 0 mm

## C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) ②		Rotational speed ②b limitation intermediate speed 4a	Fuel delivery characteristics ⑤a high idle speed ⑤b		Starting fuel delivery idle switching point ⑥		Torque-control travel ⑤	
rev/min 1	cm <sup>3</sup> /1000 strokes 2	rev/min 3	rev/min 4	cm <sup>3</sup> /1000 strokes 5	rev/min 6	cm <sup>3</sup> /1000 strokes 7	rev/min 8	Control rod travel mm 9
Pe 15 ** Pe 15 **		61D, Pe 15Z ** 104D, Pe 15Y **		108D, 146D, 45D:			600	6,0+0,5mmRW
1075	117,0-120,0	1100:0,5-1,0 mm RW less than column 2	900 700 450	115,0-119,0 113,5-117,5 103,5-108,5	100	14 - 16 * ./.		Start of timing advance: ca. 0,25 End of timing advance: min. 2,25- pressure kp/cm <sup>2</sup> (S15 with 104D)

Checking values in brackets

\* 1 mm less control rod travel than col. 2

When checking (column 2 and 5) increase by  $\pm 0,4 \text{ cm}^3/100\text{h}$

4.73

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Testoil-ISO 4113

C15

C15

## B. Governor Settings

MB 11,8 c

-2-

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min Control rod travel mm	Control rod travel mm rev/min	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
***	with governor									
****	less than column 2!					(3a)				

Torque control travel a = mm

## C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational-speed limitation intermediate speed		Fuel delivery characteristics high idle speed		Starting fuel delivery idle switching point		Torque-control travel	
rev/min	cm <sup>3</sup> /1000 strokes	rev/min	cm <sup>3</sup> /1000 strokes	rev/min	cm <sup>3</sup> /1000 strokes	rev/min	cm <sup>3</sup> /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	
Pe 1075	15Z *** 101,0-103,0	61D - 210 PS 1100:0,5-1,0 ****	900 700 450	96,0-99,0 97,0-100,0 89,0-93,0	100	14 - 16 **			
Pe 1090	15Y *** 112,0-114,0	61D - 220 PS 1125:0,5-1,0 ****	700 450	109,5-112,5 98,0-102,0	100	14 - 16 *			

Pe 15 \*\*\* 198  
1090 117,5-119,5 1120 450 104,0-108,0 100 14 - 16 \*\*

\* 1 mm less control rod travel than col. 2  
\*\* Switching point of automatic starting fuel delivery 195-130 min-1.,  
however \*\*198 - 250-180 min-1. When checking, increase full-load values  
(Columns 2 and 5) by  $\pm 1$  cm<sup>3</sup>!

## B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel		
Degree of deflection of control lever	rev/min Control rod travel mm	Control rod travel mm rev/min	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm	
1	2	3	4	5	6	7	8	9	10	11	
..PA61D, 104D, 108D, 146D						108D, 146D - ***** - 0,5 mm					
ca.68	1100	14,0-17,0	-	-	-	61D, 104D - ***** - 0 mm	ca.15	150	8,6-10,0	1100	0
	1150	9,0-13,5						300	4,6- 7,0	600	0,4-0,6
	1200	2,5- 9,5						400	3,4- 4,9		
	1230	0 - 6,8						550	1,1- 2,3	1100	8,4
	1300	0				(3a)		690	0		
..PA 198									***** = - mm		
ca.68	1110	13,4-18,2	-	-	-	ca.12	250	6,9-8,2	200-300	Start	
	1140	7,5-14,4					350	3,5-5,7	420	2,6-3,5	
	1180	0 - 9					450	0,8-2,0	800	5,0-5,4	
	1240	0					610	0	1100	8,1	
									1180-1250	end	(11)

RQV governor - for setting of sliding-sleeve travel, see test instructions WPP  
001/4 - 6th Supplement !

\*\*\*\*\* Dimension a

En

C16

C16

Testoil-ISO 4113

①

# Test Specifications Fuel Injection Pumps ① and Governors

40

VDT-WPP 001/4 VOL 10,0 b

3. Edition

En

PE 6 P 100/320 RS 52 RQ 200-1100 PA 25/2R

PA 74/2R

supersedes

12.72

company:

Volvo

engine:

TD 100 A

Port-closing test with/without ROBO diaphragm  
See page 2!

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

## A. Fuel Injection Pump Settings

Port closing at prestroke  $2,6 + 0,1$  mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm <sup>3</sup> /100 strokes 3	Difference cm <sup>3</sup> /100 strokes 4	Control rod travel mm 2	Fuel delivery cm <sup>3</sup> /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	12	11,5 - 12,3	0,5			S52: 3,5±0,1* (max.3,2-3,9)
600	6	0,5 - 1,2				
	9	4,6 - 5,8				
	12	11,4 - 12,2				
200	9	2,8 - 4,0				

\*Adjust the fuel delivery from each outlet according to the values in

in the case of greater dispersion alter the delivery-valve spring pre-tension accordingly.

## B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min	Control rod travel	Degree of deflection of control lever	rev/min	Control rod travel	Degree of deflection of control lever	rev/min	Control rod travel	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
ca.66	1150	15,0-18,0	-	-	-	ca.10	100	6,0-8,0	1150	8,9
	1400	0 - 1,5					200	4,0-6,2		
ca.62	1100	14,8-17,8					300	1,0-2,8		
	1150	10,8-14,8					400	0,4-1,9		
	1200	6,0-11,7					580	0		
	1350	0				3a				

Torque control travel a = mm

## C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational-speed limitation intermediate speed		Fuel delivery characteristics high idle speed		Starting fuel delivery idle switching point		Torque-control travel	
rev/min	cm <sup>3</sup> /1000 strokes	rev/min	cm <sup>3</sup> /1000 strokes	rev/min	cm <sup>3</sup> /1000 strokes	rev/min	cm <sup>3</sup> /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	
700	0,4 kp/cm <sup>2</sup> 143,0-146,0	1125	0,4 1080	kp/cm <sup>2</sup> 141,0-146,0	100	ca.240			
700	0 kp/cm <sup>2</sup> 100,0-104,0				200	12 - 15			
						dispersion max.1,5)*			

Checking values in brackets (increase by ± 1,0 cm<sup>3</sup>!)

\* 1 mm less control rod travel than col. 2

11.73

Testoil-ISO 4113

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C17

CA7

**B. Governor Settings**

① Upper rated speed			Intermediate rated speed			④ Lower rated speed			③ Torque control	
Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	10	11
ca. 68	1150	15,5-18,3	-	-	-	ca. 23	100	7,0-10,0	1150	8,3
	1410	0					200	5,0- 8,4		
ca. 66	1100	15,0-18,0					300	2,4- 5,2		
	1200	7,2-12,6					400	0 - 2,2		
⑤	1260	2,0- 9,0					460	0		
	1400	0								

**C. Settings for Fuel Injection Pump with Fitted Governor**

② Full-load stop		⑥ Rotational-speed limitation	③a Fuel delivery characteristics		Starting fuel delivery Idle		⑤a Idle stop	
Test oil temp. 40°C (104°F)		Note: changed to ...)						
rev/min	cm <sup>3</sup> /1000 strokes	rev/min	rev/min	cm <sup>3</sup> /1000 strokes	rev/min	cm <sup>3</sup> /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	
			⑥a					

Checking values in brackets

\*1 mm less control rod travel than col. 2

**1. Setting LDA**

Set start of adjustment - with pressure-charging - 0.25-0.29 kp/cm<sup>2</sup> by way of shims 1 420 100 606 - 612 beneath upper spring seat. When inserting shims, 0.5 mm projection dimension must however be retained at thread.

2. Problems with cranes - with pump 52, governor 25 can be changed to 74.

3. RQV governor - pay attention to WPP 001/4 - 6th Supplement!

For governor 74/2: set sliding-sleeve position 36.0 mm!

Testoil-ISO 4113

①A

①

# Test Specifications Fuel Injection Pumps ① and Governors

40

 VDT-WPP 001/4 VOL 9,6 m  
Edition 12.66

En

 PE 6 P 100/320 RS 3 RQV 200-1150 P 7/2  
 RS 11 RQV 200-1100 P 7/2  
 RS 16 RQV 200-1100 P 16/2

 supersedes 20.2.64  
 company: Volvo  
 engine: TD 96 C

 Dimension H as per test instructions  $69.5 \pm 0.1$ 

See page 2!

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

## A. Fuel Injection Pump Settings

 Port closing at prestroke  $2,7 + 0,1$  mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm <sup>3</sup> /100 strokes 3	Difference cm <sup>3</sup> /100 strokes 4	Control rod travel mm 2	Fuel delivery cm <sup>3</sup> /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
600	6	0,5 - 1,2	0,5			$3,5 \pm 0,1$ (max. 3,2-3,9)
	9	4,6 - 5,8				
	12	11,2 - 12,2				
200	9	2,8 - 4,0				

 Adjust the fuel delivery from each outlet according to the values in .

## B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	mm 11
$66 \pm 1,5$	1150	15,0-18,0	-	-	-	$10 \pm 1,5$	100	6,0-8,0	-	-
	1400	0 - 1,5					200	4,1-6,2		
$62 \pm 1,5$	1100	14,8-17,8					300	0,9-2,8		
	1150	10,8-14,8					400	0,4-1,8		
	1200	6,0-11,7					590	0		
	1250	1,0- 8,0				3a				
	1350	0								

Torque control travel a = mm

## C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) (2)		Rotational-speed limitation intermediate speed (4a)	Fuel delivery characteristics (5a) high idle speed (5b)		Starting fuel delivery idle switching point (6)		Torque-control travel (5)	
rev/min 1	cm³/1000 strokes 2	rev/min 3	rev/min 4	cm³/1000 strokes 5	rev/min 6	cm³/1000 strokes 7	rev/min 8	Control rod travel mm 9
0,4 bar	700	132,5-135,5	1125	1170	34,0-39,0	100	mind. 27	
0 bar	700	101,5-105,5			dispersion max. 4	(ca. 20 mm RW)		./.

Checking values in brackets

\* 1 mm less control rod travel than col. 2

Testoil-ISO 4113

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C19

C49

1. Full-load setting
2. Adjusting manifold-pressure compensator

The stop is to be set by means of shims such that the start of adjustment (with pressure-charging) is between 0.24 and 0.27 bar (180 - 200 mm Hg).

3. Low idle and setting of idle stop screw:

Set control rod by means of control lever at  $n\ 200 = 11 - 14\ \text{cm}^3/1000\ \text{strokes}$  (approx. control-rod travel 6.5) and position idle stop screw. The scatter of the individual cylinders may exceed  $1.5\ \text{cm}^3/1000\ \text{strokes}$ . In the event of a greater scatter, the initial tension of the valve spring is to be altered appropriately: more initial spring tension produces greater delivery and vice-versa.

4. High idle:

The delivery must be  $34 - 39\ \text{cm}^3/1000\ \text{strokes}$  at  $n\ 1170$  and max. control-lever deflection; (control-rod travel approx. 6 mm - scatter max.  $4\ \text{cm}^3/1000\ \text{strokes}$ )

5. Check starting fuel delivery  $n\ 100 = \text{min. } 27\ \text{cm}^3/1000\ \text{strokes}$ .
6. Check push-button stop.

①

# Test Specifications Fuel Injection Pumps ① and Governors

**40**  
VDT-WPP 001/4 BOS 12,3 h  
1. Edition

En

PE 6 P 120 A 721 RS 307 RQV 300-1050 PA 288 DR

Test equipment: VDT-WPP 110/2 3. Edition

supersedes -  
company: Büssing-MAN  
engine: D 3256 BTX

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

## A. Fuel Injection Pump Settings

Port closing at prestroke  $2,8 + 0,1$  mm (from BDC)

(+0,15)  
(-0,05)

**Testoil-ISO 4113**

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm <sup>3</sup> /100 strokes 3	Difference cm <sup>3</sup> /100 strokes 4	Control rod travel mm 2	Fuel delivery cm <sup>3</sup> /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	12	19,7 - 20,4	0,8			
600	9	9,6 - 11,0				
	15	21,3 - 23,2				
200	9	5,0 - 6,2				

Adjust the fuel delivery from each outlet according to the values in .

## B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min Control rod travel mm	Control rod travel mm rev/min	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
ca. 50	1050	15,0-18,8	-	-	-	ca. 13	150	9,4-11,0	1150	8,3
	1100	10,0-14,8					250	6,9- 9,2		
	1180	0- 7,4					350	2,8- 5,4	1150	0
	1260	0					450	0	550	1,4-1,5
						3a				

Torque control travel a = 1,4 mm

## C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational-speed limitation intermediate speed	Fuel delivery characteristics high idle speed		Starting fuel delivery idle switching point	Torque-control travel	
rev/min	cm <sup>3</sup> /1000 strokes	rev/min	rev/min	cm <sup>3</sup> /1000 strokes	rev/min	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8
0,7 bar			0,7 bar				
1050	205,5-208,5	1090-1100*	700	192,5-197,5	100	ca. 16mmRW	
			0 bar		Change-over point 200-170 U/min		
			500	108,0-112,0			
(increase by ± 3,0 cm <sup>3</sup> !)							

Checking values in brackets

\* 1 mm less control rod travel than col. 2

12.74

C21

C21

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Setting LDA:

1. Basic setting (Section A-B) without LDA.
2. Full-load delivery (indication with charge-air pressure) at full-load stop screw of governor. Test fuel-delivery characteristics. Fit LDA.
3. Set start of adjustment at guide sleeve of diaphragm housing.
4. Full-load delivery (without charge-air pressure) at bell crank of LDA.
5. Check end of adjustment -  $n = 500 \text{ min}^{-1}$  - decreasing pressure in bar:

Pump/governor	Start	End
307/288 D	0.37-0.40	0.14-0.18
Difference in control-rod travel with respect to full load	0.1 mm less	3.3 mm less



# Test Specifications Fuel Injection Pumps ② and Governors

VDT-WPP 001/4 FBW 11,6  
2. Edition

En

PE 6 P 110 A 721 RS 287 RQ 250/1025 PA 268 DR  
PE 6 P 120 A 721 RS 287 RQ 250/1025 PA 301 DR ./:  
110 = Testing with S nozzles and fuel lines 6 x 1,5 x 600!  
120 = Testing with T nozzles and fuel lines 8 x 2 x 1000!

supersedes -  
company: F B W  
engine: E 3 A

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

## A. Fuel Injection Pump Settings

( +0,15)  
( -0,05)

Port closing at prestroke 2,8 + 0,1 mm (from BDC)

Testoil-ISO 4113

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery 11 Ø cm <sup>3</sup> /100 strokes 3	Difference cm <sup>3</sup> /100 strokes 4	Control rod travel mm 2	Fuel delivery 12 Ø cm <sup>3</sup> /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	12			12		

Adjust the fuel delivery from each outlet according to the values in .

## B. Governor Settings

RQ .. 268 DR

Checking of slider PRG check rev/min 1		Full-load speed regulation Setting point rev/min 3		Test specifications Control rod travel mm 5		Idle speed regulation Setting point rev/min 7		Test specifications Control rod travel mm 9		Torque control rev/min 11	
600	15,1-15,7	600	15,4	1050	13,8-14,1	560	0	200	6,5-8,1	450	15,8-16,5
				1100	5,0-10,5			300	4,2-6,3		
				1140	0 - 6,5			400	0,5-3,0	950	14,0-14,4
				1200	0			460	0		

Torque-control travel on flyweight assembly dimension a = 0,6 mm

Speed regulation: At

1 mm less control rod travel

## C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F) rev/min 1		Control rod stop rev/min 3		Fuel delivery characteristics rev/min 4		Starting fuel delivery Idle speed rev/min 6	
	cm <sup>3</sup> /-1000 strokes 2				cm <sup>3</sup> /-1000 strokes 5		cm <sup>3</sup> /1000 strokes/mm 7
LDA 1000	0,7 bar 143,0-145,0 (140,0-148,0)			LDA 600	0,7 bar 153,0 - 157,0 (150,0 - 160,0)	100	14,6 - 16,6
				LDA 600	0 bar 106,0 - 112,0 (103,0 - 115,0)		

Checking values in brackets

7:75

## D. Adjustment Test for Manifold Pressure Compensator

FBW 11,6

-2-

Test at n = 500 rev/min decreasing pressure - in bar gauge pressure

Pump/governor	Setting Gauge pressure = bar	Measurement Gauge pressure = bar	Control rod travel- diminution difference mm (1)
287 / 268DR	0,54 - 0,57	0,25 - 0,29	0,1 2.1

Notes:

(1) when n = 600 rev/min and gauge pressure = 0,7 bar (= maximum full-load control rod travel)

**Testoil-ISO 4113**

## B Governor Settings

RQ .. 301 DR

FBW 11,6

-3-

Checking of slider PRG check (1)		Full-load speed regulation (4)				Idle speed regulation (5)				Torque control (3)	
rev/min 1	Control rod travel mm 2	Setting point rev/min 3	Control rod travel mm 4	Control rod travel mm 5	Test specifications rev/min 6	Setting point rev/min 7	Control rod travel mm 8	Test specifications rev/min 9	Control rod travel mm 10	rev/min 11	Control rod travel mm 12
650	15,7-16,3	650	16,0	1040 1100 1150 1210	15,6-16,0 6,8-12,0 0 - 7 0	570	0	200 300 400 470	6,8-8,1 4,4-6,6 0,6-3,2 0	-	-

Torque-control travel  
on flyweight assembly dimension a

0 mm

Speed regulation At

1 mm less control  
rod travel

## C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp 40°C (104 F) (2)		Control rod stop (3a)	Fuel delivery characteristics (3b)		Starting fuel delivery Idle speed (6)	
rev/min 1	cm <sup>3</sup> /- 1000 strokes 2	rev/min 3	rev/min 4	cm <sup>3</sup> /- 1000 strokes 5	rev/min 6	cm <sup>3</sup> /1000 strokes / mm Control rod travel 7
LDA 1000	0,9 bar 200,0-204,0		LDA 600	0,9 bar 155,0-159,0	100	14,5-16,5
LDA 1000	0 bar 152,0-158,0					
(increase by ± 3,0 cm <sup>3</sup> !)						

Checking values in brackets

## D. Adjustment Test for Manifold Pressure Compensator

Test at n = 500 rev/min decreasing pressure - in bar gauge pressure  
increasing

Pump/governor		Setting	Measurement	Control rod travel- diminution difference
		Gauge pressure = bar	Gauge pressure = bar	mm (1)
287	268DR	0,54 - 0,57	0,25 - 0,29	0,1 2,1
287	301DR	0,68 - 0,71	0,46 - 0,50	0,1 1,7

Notes

(1) when n =

En

600

1000

rev/min and  
gauge pressure 0,7  
0,9

bar (= maximum full-load control rod travel)

Testoil-ISO 4113

# Test Specifications Fuel Injection Pumps ①A and Governors

40

VDT-WPP 001/4

3. Edition

En

PE 6 P 130 A 720 RS 300 EP/RSV 250-900 P 7/812 (1)  
PE 8 P 130 A 920 RS 301 EP/RSV 250-900 P 7/812 (2)  
..S300, 301 RQV 750 PA339R ./.  
Testing with T nozzles and fuel lines 8 x 2 x 1000!

supersedes 1.76  
company Jenbacher Werke  
engine C 120 S (1)  
C 160 S (2)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

## A. Fuel Injection Pump Settings

Port closing at prestroke 2,5 + 0,1 mm (from BDC)

Testoil-ISO 4113

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm <sup>3</sup> /100 strokes 3	Difference cm <sup>3</sup> /100 strokes 4	Control rod travel mm 2	Fuel delivery cm <sup>3</sup> /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
600	12	26,9 - 27,5				
	6	7,4 - 8,6				
	15	36,3 - 38,9				
200	6	2,2 - 3,2				

Adjust the fuel delivery from each outlet according to the values in

## B. Governor Settings

① Upper rated speed rev/min			Intermediate rated speed			④ Lower rated speed			③ Torque control	
Degree of deflection of control lever 1	Control rod travel mm 2	Control rod travel mm rev/min 3	4	5	6	Control-lever deflection in degrees 7	rev/min 8	Control rod travel mm 9	rev/min 10	Control rod travel mm 11
ca. 60	900 950 980	16,0 9,7 4,0	without auxiliary spring			ca. 25	250	6,0	880	0
②a	950 980 1100	8,2-11,3 3,1- 7,1 0,3- 1,0					100 250 350 450	19 - 21 5,7-6,3 0,6-3,1 0 - 1	290	1,2-1,8

The numbers denote the sequence of the tests

## C. Settings for Fuel Injection Pump with Fitted Governor

②b Full-load stop		⑥ Rotational-speed limitat		③a Fuel delivery characteristics		Starting fuel delivery ⑤		④a Idle stop	
Test oil temp. 40°C (104°F)		Note: changed to ... rev/min		rev/min		rev/min		rev/min	
rev/min 1	cm <sup>3</sup> /1000 strokes 2	3		4	cm <sup>3</sup> /1000 strokes 5	6	cm <sup>3</sup> /1000 strokes 7	8	Control rod travel mm 9
ca. 10 mm RW		910							./.

Checking values in brackets

\* 1 mm less control rod travel than col 2

9.77

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**Shutoff solenoid: (ELAB)**

When installing the solenoid, it is to be noted that the control rod must simultaneously be pulled on to stop by the stop lever!

The stop lever of the ELAB must be introduced into the link of the RSV governor!

Then

Functional test of shutoff solenoid: set solenoid such that control rod comes to a halt 1.5...2.5 mm before end position.

Approximately 21 mm control-rod travel must also be attained with the solenoid connected and the start knob pressed in!

En

**B. Governor Settings**

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min Control rod travel mm	Control rod travel mm rev/min	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
ca. 29	710 730 750 775 800	18,4-21,4 14,4-18,6 10,0-12,0 3,5- 5,8 0	-	-	-	-	-	-	750	5,7
						(3a)				

Torque control travel a = mm

**C. Settings for Fuel Injection Pump with Fitted Governor**

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational-speed limitation intermediate speed	Fuel delivery characteristics high idle speed		Starting fuel delivery idle switching point		Torque-control travel	
rev/min	cm <sup>3</sup> /1000 strokes	rev/min	rev/min	cm <sup>3</sup> /1000 strokes	rev/min	cm <sup>3</sup> /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9
ca.	10 mm RW	760						

Checking values in brackets

\* 1 mm less control rod travel than col. 2

**D. Adjustment Test for Manifold Pressure Compensator**Test at n = rev/min decreasing pressure - in bar gauge pressure  
increasing

Pump/governor	Setting	Measurement	Control rod travel-diminution difference
	Gauge pressure = bar	Gauge pressure = bar	mm

En

Testoil-ISO 4113